

RESEARCH MEMORANDUM

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OF FLAP EFFECTIVENESS ON THIN RECTANGULAR

WINGS AT TRANSONIC SPEEDS

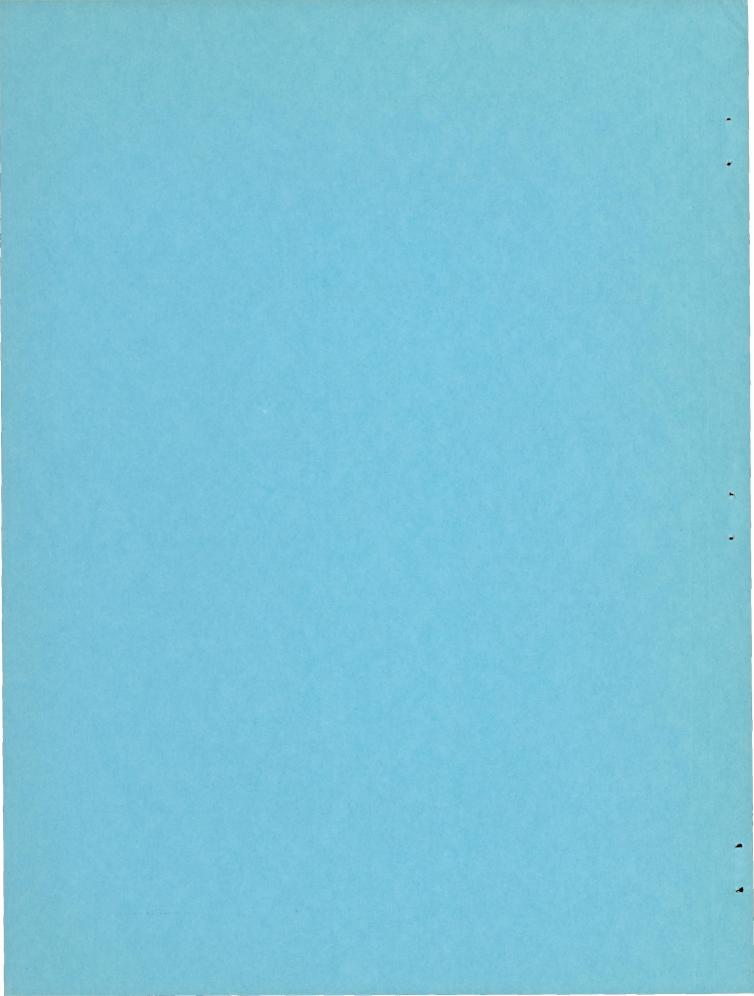
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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

WASHINGTON

August 23, 1956 Declassified May 16, 1958



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THE VARIATION WITH WING ASPECT RATIO

OF FLAP EFFECTIVENESS ON THIN RECTANGULAR

WINGS AT TRANSONIC SPEEDS

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SUMMARY

A wind-tunnel investigation has been made in the Langley high-speed 7- by 10-foot tunnel by use of the transonic-bump technique to study the effectiveness of full-span flap-type controls on 31 unswept rectangular wings. Plain flaps with flap-chord ratios of 0.1, 0.2, 0.3, and 0.4 were tested on wings of aspect ratios from 1 to 6 at Mach numbers from 0.4 to 1.1. The data for the most part are presented without analysis.

TNTRODUCTION

The variation of control effectiveness with wing aspect ratio and flap-chord ratio is well known at low subsonic speeds (refs. 1 to 5) and at supersonic speeds (refs. 6 and 7). There is, however, very little known about these effects at transonic speeds. In addition there are only a few systematic data available for controls on the thinner (4- to 6-percent thick) airfoils at transonic speeds.

The present paper presents the results of a wind-tunnel investigation to determine flap-effectiveness parameters using 31 small-scale rectangular semispan wings equipped with full-span plain flaps. The transonic speeds were obtained by using the transonic-bump technique in the Langley high-speed 7- by 10-foot tunnel. The variables investigated were wing thickness (4 and 6 percent), wing aspect ratio (aspect ratios from 1 to 6), and flap-chord ratio (flap-chord to wing-chord ratios of 0.1 to 0.4).

In order to expedite the publication of the results, no detailed analysis or discussion of the data will be made. All of the data are presented in tabulated form and in addition some data showing significant trends are presented in graphic form.

SYMBOLS

$\mathtt{C}_{\mathtt{L}}$	lift coefficient, Twice semispan lift qS
c_{D}	drag coefficient, Twice semispan drag
C_{m}	pitching-moment coefficient about 0.25c, <u>Twice semispan pitching moment</u> qSc
Cl	rolling-moment coefficient, Semispan rolling moment qSb
C_n	yawing-moment coefficient, Semispan yawing moment qSb
ъ	wing span, ft
С	wing chord, ft
cf	flap chord, ft
S	wing area, sq ft
t	wing thickness, ft
A	wing aspect ratio, $\frac{b^2}{S}$
q	free-stream dynamic pressure, $\frac{1}{2}$ pV ² , lb/sq ft
V	free-stream velocity, ft/sec
ρ	free-stream density, slugs/cu ft
R	Reynolds number based on wing chord
М	free-stream Mach number
MZ	local Mach number
α	angle of attack, deg
δ	flap deflection, deg

of attack caused by unit angular change in control-surface deflection

 $C_{L_{\alpha}}$ lift-curve slope, $\frac{\partial C_{L}}{\partial \alpha}$

MODELS

The geometric characteristics of the models used in the investigation are given in figure 1. The models were machined from solid steel to either NACA 65A004 or NACA 65A006 airfoil sections. The basic models had no twist or camber and had a taper ratio of 1. The aspect ratio was varied by cutting the wings at the appropriate spanwise station and filing the tip normal to the chord plane.

The flaps were machined integrally with the wing at a deflection of approximately 10°. The flap chords and actual deflections are given on figure 1.

TESTS

The tests were made by using the transonic-bump technique in the Langley high-speed 7- by 10-foot tunnel. The models were attached to a five-component electrical-strain-gage balance beneath the bump surface. The tests were made over a Mach number range from 0.4 to 1.1 at Reynolds numbers varying from 0.5×10^6 to 1.5×10^6 (fig. 2). The variation of the local Mach number over the bump in the vicinity of the model is shown in figure 3.

The test angles of attack varied from -10° to 25° whenever the loads encountered did not exceed the design limit of the balance. The aspect ratio varied from 6 to 2 on the 6-percent-thick wings and from 4 to 1 on the 4-percent-thick wings. Flap chords varied from 0 to 0.4c.

The data have not been corrected for jet-boundary effects on blocking since the models were sufficiently small with respect to tunnel boundaries to make the corrections negligible. No corrections were applied to account for flap deflection under load since checks indicated these too were small. The roll and yaw data presented represent the rolling- and yawing-moment coefficients resulting from deflection of the control on one wing. Since no reflection-plane corrections have been applied to the data, they represent symmetrically deflected controls and

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should be reduced if applied to antisymmetric deflection. The magnitude of the corrections (reflection plane) at M=0 obtained from references 3 and 4 are given in figure 4. The variation of the correction with Mach number has not been established in the transonic-speed range but does decrease to 0 at supersonic speeds.

Because of the small physical size of the models and the resulting inaccuracies in the measurement of the forces and moments, care should be taken in analyzing the tabulated data especially at the lower Mach numbers.

RESULTS AND DISCUSSION

The force and moment data obtained in this investigation are presented in tables 1 to 6.

A comparison of the lift-curve slope $C_{L_{\alpha}}$ with theory is given in figure 5 at M = 0.4. The variation of $C_{L_{\alpha}}$ with Mach number is given in figure 6 for the various wings investigated. Figure 7 presents the flap-effectiveness parameter α_{δ} as a function of flap-chord ratio at all the test Mach numbers. A comparison of α_{δ} with theory is shown in figure 8.

The variation of the lift-curve slope with aspect ratio at M = 0.4 (fig. 5) shows exceptional agreement with the theory of reference 8. The variation of $C_{L_{\alpha}}$ with M (fig. 6) is presented to give a more complete meaning to the values of α_{δ} presented.

The variation of the flap-effectiveness parameter α_{δ} with flap-chord ratio (fig. 7) is presented in order to eliminate the necessity of plotting all the lift data to see the trends with Mach number and aspect ratio. The values of α_{δ} plotted in figure 7 were obtained by dividing the change in angle of zero lift from the plain wing to the flapped wing by the flap deflection and therefore represent the value of α_{δ} at $C_L=0$. This method is somewhat more accurate than using $C_{L_{\delta}}/C_{L_{\alpha}}$ and except where there are nonlinearities in the lift curve give the same value. A comparison of the variation of α_{δ} with aspect ratio with the subsonic (ref. 5) and supersonic (ref. 6) theories (fig. 8) show that at M = 0.4 and 1.1 the theories predict the variation quite satisfactorily but not the magnitude. At a Mach number of 0.9 neither theory gives either a satisfactory variation or the correct

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magnitude. The disagreement between theory and experiment in magnitude is typical and results to some extent from the thickened boundary layer at the trailing edge. The magnitude at M = 0.4 agrees quite well with other published data, for example reference 9. These results indicate that both in the subsonic- and supersonic-speed ranges the available theories can be used to obtain the variation of α_{δ} with A, but in the transonic range the variation must be obtained from experimental studies.

It should be pointed out that these data are for only one value of δ , and, although they are useful in determining the effects of the several variables, they are not necessarily applicable to the design of a control surface that uses small deflections in the transonic-speed range (see ref. 10).

Langley Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., May 4, 1956.

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Table 1.- the aerodynamic characteristics of the aspect ratio 1 model $\frac{t}{c}=\text{0.04} \qquad \frac{^{C}f}{^{C}}=\text{NONE}$

a, deg	CT.	C _D	C _M	cı	C _n	a, deg	C _L	C _D	C _M	cı	C _n
		м	= 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4253 2982 2324 1666 1228 0965 0702 0351 0132 0088 0570 1272 2280 4297 6884 8419					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 2 2 2 2 5 2 2 5 7 10 2 2 5 2 5 2 5 2 5 2 5 7 1 2 5 2 5 2 5 2 5 2 5 2 5 2 5 2 5 2 5 2	4323 2832 2025 1280 0783 0534 0199 0087 0460 0832 1665 2509 3938 8870 9689	.0825 .0440 .0276 .0201 .0196 .0164 .0159 .0196 .0214 .0306 .0477 .0855 .1893 .3421 .4765	*0001 -0081 -0139 -0138 -0065 -0009 *0023 *0090 *0119 *0122 *0142 *0069 -0357 -1009 -1365	0490 0316 0222 0147 0057 0026 .0015 .0045 .0094 .0170 .0275 .0448 .0765 .1044 .1123	.0150 .0096 .0071 .0049 .0033 .0018 .0024 .0025 .0071 .0119 .0193 .0354 .0529
		М	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	40892915213214141044074004350174 0044 .0392 .1784 .3197 .5068 .7830	.0705 .0461 .0374 .0331 .0322 .0365 .0374 .0426 .0579 .0748 .1122 .2162 .3689 .5029	0178 0135 0183 0119 0134 0116 0048 0002 0013 0035 0021 0173 0825 1325	0383 0310 0225 0152 0012 0072 0033 .0000 .0033 .0079 .0165 .0257 .0416 .0673 .0983 .1089	0193 0120 0082 0063 0054 0044 0026 0035 0051 0054 0089 0016 0294 0506	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 226 25	4396 2887 1164 0748 0392 0154 0143 05558 0855 1711 2756 4301 7105 9362 0740	.0901 .0468 .0292 .0216 .0204 .0192 .0188 .0192 .0221 .0321 .0513 .0946 .2074 .3600 .5201	.0047 0098 0126 0147 0019 0013 .0115 .0165 .0172 .0092 0071 0575 1068	0505 0332 0233 0137 0090 0047 0025 .0011 .0051 .0090 .0180 .0296 .0490 .0829 .1103 .1280	*0121 *0074 *0050 *0042 *0031 *0012 *0014 *0031 *0050 *0117 *0173 *0337 *0571
		М	> 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 4059 - 2848 - 2066 - 1299 - 0826 - 0517 - 00236 0030 0280 0635 - 1417 - 2022 3335 - 5564 8235 8973	00717 00398 00289 00254 00239 00233 00254 00239 00233 00254 00289 00398 00543 00921 1966 4501	0080 0130 0136 0097 0001 .0010 .0017 .0084 .0083 .0120 .0147 0172 0176 0962 1333	0457 0304 0215 0134 0099 0067 0027 .0013 .0045 .0080 .0166 .0255 .0403 .0694 .0954 .1052	.0150 .0092 .0058 .0030 .0030 .0028 .0028 .0049 .0049 .0049 .0049 .0049 .0049	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	4471 2878 1854 1229 0751 0466 0148 0159 0592 0933 1752 2730 4380 7167 9488 1. 1467	.0894 .0480 .0291 .0223 .0207 .0212 .0191 .0207 .0218 .0234 .0346 .0526 .0951 .2155 .3770 .5684	.0143 0064 0168 0103 0078 0023 .0001 .0077 .0110 .0125 .0039 0181 0655 1176 1673	0511 0331 0214 0138 0056 0052 0010 .0034 .0066 .0104 .0193 .0304 .0493 .0304 .0493 .1149 .1381	.0081 .0055 .0023 .0002 -0020 -0022 -0017 -0053 -0020 -0020 .0061 .0144 .0293 .0518
		М	= 0.90					М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4232 2839 1901 1276 0755 0560 0234 0026 0378 0677 1589 2370 3737 6368 8516 9298	.0461	0047 0119 0068 0118 0076 0010 .0004 .0092 .0113 .0165 0096 0250 1014	0474 0316 0217 0134 0091 0059 0020 .0020 .0051 .0091 .0174 .0269 .0435 .0755 .0976 .1086	.0159 .0104 .0078 .0055 .0047 .0034 .0025 .0013 .0017 .0034 .0070 .0125 .0201 .0337 .0494 .0632	7	4467 2934 1960 1204 0766 0471 0120 .0131 .0602 .0876 .1741 .2628 .4204 .7051 .9416	.0823 .0442 .0274 .0195 .0173 .0155 .0151 .0145 .0204 .0232 .0344 .0539 .1023 .2277 .3931 .5709	.0158 0052 0133 0132 0098 0054 0031 0003 0121 .0108 .0028 0183 0675 1206	0515 0339 0219 0133 0083 0050 0017 .0027 .0067 .0100 .0199 .0299 .0482 .0830 .1156	.0053 .0008 -00011 -0025 -0027 -0030 -0035 -0022 -0033 -0014 .0014 .0083 .0231 .0452 .0657

TABLE 1.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 1MODEL - Continued $\frac{c_{\rm f}}{c_{\rm f}} = 0.04 \qquad \frac{c_{\rm f}}{c_{\rm f}} = 0.10$

α, deg	C _L .	C ^D	C _M	cı	Cn	a, deg	cr	C _D	C _M	cı	C _n
		М =	0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2981 2104 1227 0526 0044 .0377 .0570 .0745 .1008 .1096 .1622 .2411 .3507 .8109 .9863					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3042 1751 0993 -0000 -0335 -0807 -1056 -1465 -1465 -12173 -3080 -3850 -5377 -8072 1-0059 1-0853	.0507 .0268 .0209 .0176 .0415 .0226 .0268 .0318 .0373 .0390 .0586 .0849 .1356 .2620 .4262	0513 0705 0718 0678 0667 0667 0662 0611 0580 0598 0598 0592 1072 1552	035. 0181 0075 0075 0072 0117 0158 0200 0233 0271 0478 0667 1006 1266 1345	.0200 .0171 .0144 .0121 .0126 .0123 .0119 .0150 .0202 .0269 .0350 .0523 .0733 .0881
		М =	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2610 1631 0696 0152 .0196 .0305 .0631 .0979 .1196 .1588 .2284 .2958 .4350 .6634 .9179	.0344 .0278 .0309 .0331 .0309 .0344 .0183 .0492 .0522 .0631 .0792 .1057 .1649 .2801 .4750	0732 0826 0849 0741 0922 0813 0795 0765 0651 0651 0620 0607 0917 1395 1787	0271 0152 0059 .0013 .0066 .0099 .0145 .0178 .0225 .0257 .0376 .0462 .0937 .0462 .0937 .1234	.0202 .0148 .0127 .0117 .0098 .0117 .0117 .0117 .0139 .0145 .0174 .0221 .0326 .0553 .0791 .1063	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3302 1782 0772 0024 -0416 -0772 -1069 -1413 -1805 -2138 -2945 -3991 -5570 -8314 1.0452	.0637 .0373 .0228 .0200 .0221 .0257 .0285 .0292 .0373 .0409 .0577 .0853 .1425 .2710 .4404 .6285	-0394 -0592 -0670 -0767 -0712 -0675 -0620 -0730 -0558 -0566 -0625 -0845 -1285	-0371 -0191 -0065 -0025 -0072 -0151 -0151 -0187 -0220 -0263 -0360 -0486 -0681 -1024 -1323 -1503	*0190 *0155 *0191 *0112 *0107 *0105 *0110 *0124 *0138 *0128 *0255 *0333 *0506 *0734 *0980
		М :	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2775 1594 0841 0074 .0266 .0620 .1107 .1210 .1845 .2686 .3321 .4649 .7010 .9475	.0413 .0283 .0248 .0248 .0248 .0253 .0354 .0354 .0463 .0463 .0466 .0865 .1393 .2642 .4327 .5576	-0711 -0784 -0789 -0665 -0669 -0566 -0546 -0563 -0593 -0593 -0593 -0593 -0593 -0593 -0593	0304 0152 0058 -0031 -0076 -0112 -0143 -0179 -0220 -0269 -0358 -0457 -0855 -0922 -1182 -1258	.0204 .0156 .0120 .0110 .0110 .0110 .0118 .0133 .0148 .0180 .0234 .0352 .0515 .0719 .0886	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	3470 1843 0853 0205 .0364 .0705 .0933 .1160 .1729 .2036 .2867 .8077 .8077 .80330 1.1922	1297 0425 0314 0257 0273 0291 0303 0319 0403 0441 0637 0890 1422 2735 6534	-0298 -0571 -0681 -0705 -0689 -0645 -0655 -0557 -0577 -0676 -0877 -1344 -1770 -2215	0400 0207 0083 .0010 .0062 .0104 .0138 .0179 .0214 .0255 .0349 .0466 .0663 .1008 .1325 .1540	0132 0075 0075 0055 0055 0055 0065 0065 0065
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-,2851 -,1627 -,0885 -,0130 -,0417 -,0755 -,1146 -,1406 -,1835 -,2109 -,2890 -,3749 -,5116 -,7610 -,9893 1,0284	0443 0250 0172 0206 0185 0219 0250 0281 0364 0396 0583 0820 1356 2541 4251	0597 0769 0773 0728 0685 0661 0643 0562 0581 0545 0545 0584 0937 1635	0328 0158 0055 .0036 .0079 .0118 .0158 .0233 .0272 .0364 .0470 .0648 .0956 .1201	.0218 .0172 .0140 .0121 .0121 .0123 .0123 .0125 .0146 .0193 .0257 .0350 .0520 .0706 .0849	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25 -10	276614700545003305340926105613941906233023302336297329730512	.0749 .0760 .0440 .0407 .0418 .0440 .0451 .0547 .0599 .0815 .1093 .1703 .3043 .4735 .6556 .0686	0220 0510 0625 0728 0629 0668 0529 0536 0623 0848 1237 1652 2090 0283	0294 0126 0010 0083 0126 0201 0238 0271 0311 0403 0506 0690 1021 1335 1559 0317 0317	.002: .003: .005: .006: .007: .006: .008: .013: .016: .024: .037: .056.

TABLE 1.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 1MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.20$

a, deg	CL	CD	C _M	cı	Cn	a, deg	CL	CD	C _M	cı	C _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-,2322 -,1227 *,0570 .0000 .0526 .0833 .1183 .1402 .1709 .1972 .2410 .3330 .4250 .6179 .8238 1.0254					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2334 0881 0062 .0646 .1179 .1825 .2135 .2570 .2880 .3687 .3687 .6108 .8864 1.0726	.0519 .0281 .0214 .0226 .0276 .0293 .0348 .0377 .0469 .0745 .1008 .1587 .2930 .4531 .5837	0758 0888 0958 0947 0947 0947 0964 0886 0718 0886 0718 0886 0718 1554 1910	0264 0109 .0000 .0083 .0132 .0169 .0211 .0252 .0282 .0320 .0411 .0558 .0697 .1017 .1250	.007: .005: .004: .004: .005: .005: .005: .006: .009: .013: .019: .027:
		М	= 0.60					М	= 1.00	44 10	
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2195 1022 0326 .0413 .0696 .1025 .1282 .1717 .1978 .2282 .2978 .3739 .4999 .7042 .9542	.0265 .0170 .0161 .0248 .0265 .0322 .0387 .0488 .0535 .0748 .0535 .0748 .0535 .0748 .0535 .0748 .0535 .0748	0800 0811 0787 0760 0784 0734 0801 0791 0779 0757 0768 +.0868 1383 1638	0264 0132 0040 .0040 .0040 .0112 .0165 .0191 .0231 .0271 .0362 .0462 .0620 .0877 .11347	**************************************	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2576 0962 0024 00712 1175 1864 2220 2612 2873 4713 6387 8833 1-0852 1-2063	.0641 .0321 .0264 .0265 .0321 .0351 .0480 .0525 .0748 .0525 .0748 .1593 .2978 .4694		0299 0119 .0000 .0083 .0133 .0173 .0245 .0281 .0313 .0403 .0515 .0695 .1009 .1272	.0081 .0047 .0045 .0045 .0045 .0048 .0053 .0064 .0079 .0134 .0183 .0262 .0437 .0459 .0918
		м	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2110 0989 0236 .05546 .0959 .1181 .1609 .1830 .2214 .2538 .3350 .4118 .5387 .7645 .9918	.0363 .0239 .0195 .0218 .0254 .0275 .0328 .0363 .0422 .0493 .0697 .0945 .1508 .2671 .4383 .5661	0750 0817 0815 0835 0747 0824 0728 0712 0762 0773 0773 0738 1019 1603 1818	0237 0112 0009 .0076 .0112 .0139 .0179 .0224 .0260 .0300 .0385 .0479 .0636 .0896 .1142 .1191	.00 99 .00 58 .00 45 .00 45 .00 45 .00 52 .00 64 .00 77 .00 77 .01 20 .01 72 .02 51 .04 21 .06 24 .07 53	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	265111720148 -0592 -1081 -1411 -1729 -2036 -2469 -2810 -3640 -4539 -6075 -8578 1.0739 1.2241	.0698 .0437 .0337 .0307 .0307 .0307 .0337 .0364 .0111 .0476 .0514 .0739 .1019 .1568 .2933 .4721	0701 0914 1017 1056 1037 1027 1014 1014 0928 0928 0984 1170 1553 1952	0297013800170076013801620200023502690311039005010673099112671453	.0061 .0010 .0003 .0020 .0018 .0023 .0026 .0035 .0053 .0069 .0117 .0150 .0236 .0408 .0408
		М	= 0.90		347			М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2265 0924 0143 .0677 .1159 .1393 .1718 .2070 .2473 .2695 .3567 .4517 .5884 .8305 1.0284 1.0596	.0469 .0255 .0180 .0206 .0242 .0268 .0320 .0364 .0448 .0500 .0755 .1523 .2786 .4418 .5722	0790 0878 0897 0939 0869 0864 0784 0787 0814 0845 0902 1098 1098	0245 0095 .0000 .0087 .0130 .0158 .0198 .0233 .0265 .0308 .0395 .0505 .0679 .0968 .1177	.0076 .0049 .0042 .0040 .0042 .0047 .0049 .0066 .0077 .0097 .0138 .0200 .0286 .0463 .0463 .0740	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2639 1380 0252 .0515 .1062 .1358 .1719 .2452 .2759 .3580 .4566 .6022 .8430 1.0445 1.2044	.0613 .0377 .0269 .0258 .0280 .0296 .0339 .0440 .0523 .0742 .1040 .1627 .3070 .4771	0656 0858 0946 1033 1035 1019 1011 1014 0923 0914 0923 1184 1574 1574 1529 2289	0299014000170076012001560199023602660309039905020668097312321432	.0008 .0000 -0013 -0006 .0000 .0011 .0024 .0035 .0053 .0091 .0139 .0217 .0382 .0582

TABLE 1.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 1MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.30$

a, deg	C.T.	CD	C _M	cı	Cn	a, deg	C _L	C _D	C _M	cı	Cn
		М	- 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1532 0350 .0569 .1094 .1313 .1663 .2101 .2320 .2408 .2714 .3590 .4071 .5340 .7004 .9018					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	158801740608	.0514 .0323 .0275 .0288 .0335 .0377 .0439 .0506 .0598 .0683 .0928 .1251 .1857 .1648 .2514	0805 0908 0907 0961 0955 0981 0966 0914 0968 0950 1015 1136 1349 1592	-:0166 -:0004 :0087 :0173 :0222 :0260 :0309 :0354 :0392 :0451 :0451 :0452 :0843 :1416 :1371	.00 99 .00 72 .00 60 .00 56 .00 69 .00 72 .00 81 .00 97 .01 23 .01 71 .02 29 .03 21 .05 01 .07 11
		M	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 1412 - 0326 - 0326 - 1086 - 1412 - 1716 - 2064 - 2264 - 2607 - 3041 - 3910 - 4605 - 5930 - 7820 1 0122 1 1515	.0460 .0374 .0365 .0426 .0482 .0513 .0586 .0643 .0717 .1334 .1047 .1334 .3163 .5022 .6729		0172 0040 .0046 .0125 .0165 .0204 .0250 .0250 .0323 .0376 .0488 .0587 .0778 .1015 .1278	.0139 .0089 .0079 .0066 .0070 .0070 .0073 .0098 .0120 .0152 .0205 .0329 .0493 .0752 .1017	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1840 0380 0629 1365 1959 2576 2873 3384 3681 	.0608 .0404 .0321 .0328 .0368 .0420 .0480 .0537 .0632 .0712 .0976 .1285 .1287 .3410 .5162 .6703	-0841 -0994 -1042 -1065 -1126 -1076 -1114 -1114 -1022 -1063 -1129 -1294 -2014 -2111	0184 0015 0105 0187 0245 0277 0313 0357 0393 0436 0537 0645 0832 1167 11509	*0112 *0076 *0064 *0069 *0072 *0078 *0100 *0123 *0164 *0214 *0293 *0480 *0708 *0880
		м :	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1327 0221 .0310 .1062 .1549 .2271 .2478 .2832 .3171 .4071 .4867 .6150 .8407 .0472 1.0767	.0428 .0304 .0327 .0363 .0407 .0472 .0522 .0587 .0675 .0920 .1212 .1799 .3047 .6079	0715 0760 0813 0795 0759 0764 0723 0784 0733 0780 0699 0746 0821 1003 1621 1797	0174 0036 .0049 .0130 .0174 .0210 .0251 .0295 .0336 .0381 .0474 .0577 .0756 .1240 .1293	*0122 *0079 *0069 *0069 *0069 *0071 *0084 *0103 *0122 *0161 *0229 *0311 *0489 *0680 *0815	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	1933 0398 -0568 -1364 -1853 -2217 -2524 -2853 -3308 -3468 -5559 -6980 -9550 1-1414 1-2778	.0643 .0418 .0337 .0337 .0346 .0391 .0448 .0514 .0587 .0682 .0928 .1257 .1844 .3354 .7201	-0848 -1036 -1115 -1163 -1183 -1158 -1149 -1130 -1067 -1085 -1137 -1320 -1705 -2061 -2376	0186 0021 -0093 -0186 -0228 -0265 -0307 -0341 -0376 -0428 -0521 -0649 -0821 -1152 -1418 -1618	.0083 .0033 .0040 .0049 .0046 .0049 .0040 .0073 .0099 .0182 .0248 .0390 .0611
		М =	= .0.90					М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 1 2 3 5 7 10 15 20 25	1470 0325 .0624 .1210 .1756 .1977 .2368 .2563 .3125 .3486 .4384 .5268 .6764 .9184 1.0797	.0447 .0302 .0268 .0289 .0359 .0421 .0467 .0653 .0908 .1197 .1811 .3166 .4798	0828 0910 0851 0866 0903 0872 0912 0803 0874 0875 0935 1235 1716 1843	0150 0016 .0083 .0170 .0213 .0253 .0292 .0336 .0379 .0430 .0529 .0628 .0813 .1121 .1318 .1322	.0110 .0079 .0059 .0055 .0057 .0057 .0057 .0057 .0072 .0091 .0146 .0219 .0295 .0484 .0671	-10 -7 -5 -3 -2 -1 0 1 1 2 3 5 7 7 10 15 20 25	1959 0438 .0580 .1335 .1783 .2188 .2440 .3600 .4486 .5328 .5328 .6893 .9256 .1160	.0571 .0365 .0306 .0306 .0344 .0387 .0442 .0484 .0591 .0689 .0941 .1265 .1910 .3497 .5381	0869 1018 1105 1161 1170 1150 1170 1180 1074 1083 1108 1149 1341 1686 2144 2378	0196 0027 .0047 .0179 .0222 .0262 .0295 .0329 .0365 .0412 .0505 .0611 .0794 .1112 .1408 .1590	0029 0032 0024 0019 0016 0011 0003 .0008 .0027 .0045 .0094 .0131 .0173 .0289 .0490

TABLE 1.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 1MODEL - Concluded $\frac{t}{c} = 0.04 \qquad \frac{^{\rm c}f}{c} = 0.40$

a, deg	CL	CD	C _M	cı	C _n	a, deg	CL	C _D	C _M	cı	C _n
		М =	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	0306 0569 .0263 .1007 .1226 .1488 .1882 .2320 .2320 .2327 .4640 .5384 .6916 .9061					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1291 .0000 .0906 .1564 .2023 .2334 .2706 .3017 .3563 .3898 .4779 .5710 .7275 .9857 1.1545	.0569 .0415 .0397 .0439 .0439 .0531 .0691 .0690 .0787 .0886 .2105 .3640 .5373 .6349	0972 1003 1033 1047 1009 1003 1076 1017 1029 1036 1093 1240 1562 1870 1863	0124 .0030 .0124 .0203 .0249 .0290 .0335 .0478 .0430 .0478 .0588 .0708 .0896 .1231 .1473 .1393	.0124 .0097 .0090 .0092 .0097 .0103 .0106 .0112 .0142 .0222 .0276 .0359 .0558 .0742 .0821
		М =	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	0978 -0261 .0304 .0869 .1217 .1521 .2086 .2781 .3151 .4085 .4780 .6041 .7779 1.0321 1.0995	.0074 .0235 .0448 .0535 .0537 .0643 .0491 .0761 .0695 .0813 .0960 .1369 .2064 .3346 .5267	0592 0836 0720 0738 0695 0713 0581 0768 0719 0767 0737 0800 0826 1002 1648 1742	0112 -0000 -0086 -0158 -0204 -0250 -0284 -0382 -0435 -0547 -0646 -0818 -1075 -1371 -1411	**0117** ***0092** ***0114** ***0114** ***0114** ***0120** ***0193** ***0193** ***0256** ***0366** ***0534** ***0802** ***0960**	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1484 -0024 -0026 -1733 -2172 -2587 -2848 -3169 -3691 -4071 -4937 -6006 -7525 -9875 1-1774 1-1869	.0672 .0449 .0449 .0479 .0536 .0596 .0660 .0729 .0828 .0933 .11548 .2217 .3760 .5664 .7005	-:1011 -:1122 -:1133 -:1191 -:1187 -:1211 -:1214 -:1231 -:1169 -:1179 -:1174 -:1261 -:1453 -:1784 -:2138	-0144 0029 0137 0223 0270 0317 0360 0407 0414 0497 0609 0731 0918 0918 1512 1523	*0114 *0093 *0083 *0076 *0071 *0074 *0081 *0105 *0131 *0171 *0226 *0318 *0502 *0756 *0877
		М :	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1210 0738 .0708 .1372 .1697 .1995 .2375 .2641 .3231 .3394 .5061 .6477 .8498 1.0298	.0472 .0398 .0363 .0437 .0472 .0531 .0596 .0676 .0770 .0856 .11487 .2068 .3266 .3266 .5949	0797 0653 0752 0797 0742 0785 0737 0850 0024 0829 0783 0823 1092 1092 1710	0107 -0013 -0103 -0179 -0224 -0269 -0304 -0358 -0398 -0439 -0546 -0649 -0842 -1088 -1276 -1294	0129 0097 0094 0099 0101 0105 0107 0116 0135 0148 0204 0255 0354 0716 0804	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1466 -0102 -0863 -1647 -2113 -2511 -2795 -3113 -3704 -4033 -4919 -5862 -7226 -9634 1.1497 1.2724	.0686 .0502 .0436 .0475 .0532 .0570 .0625 .0704 .0811 .0911 .1172 .2168 .3776 .5699 .7621	-1048 -1210 -1219 -1263 -1286 -1253 -1258 -1292 -1218 -1232 -1218 -1337 -1489 -1825 -2488	- 0145 0010 0131 0214 0258 0303 0348 0393 0434 0489 0589 0700 0889 1234 1493 1679	.0071 .0056 .0056 .0049 .0049 .0045 .0059 .0079 .0111 .0152 .0197 .0266 .0431 .0888
		М	= .0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1249 .0078 .0820 .1444 .1887 .2212 .2577 .2876 .3357 .3725 .3725 .3725 .9525 1,0775	0544 0396 0396 0435 0461 0333 0609 0697 0768 21153 1460 24079 3495 5093 6145	0950 0935 0945 0945 0997 0914 0973 0874 0920 0946 1052 1779 1810	0107 -0032 -0115 -0194 -0233 -0280 -0324 -0367 -0411 -0466 -0564 -0691 -0873 -1196 -1354	.0125 .0093 .0091 .0091 .0089 .0091 .0093 .0095 .0112 .0140 .0187 .0240 .0329 .0537 .0702 .0789	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	1706 0219 .0700 .1531 .1881 .2538 .3063 .3500 .3806 .4594 .5600 .7000 .9450 .1288 1.2513	.0645 .0516 .0473 .0324 .0538 .0602 .0689 .0753 .0860 .0969 .1247 .1614 .2367 .3981 .7790	1013 1128 1177 1225 1163 1203 1179 1179 1196 1296 1512 1823 2199 2506	0166 .0017 .0120 .0202 .0242 .0279 .0319 .0375 .0408 .0458 .0674 .0859 .1181 .1454 .1653	.0003 .0010 .0006 .0010 .0006 .0014 .0030 .0046 .0062 .0151 .0200 .0348 .0564

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO $_2$ Model $\frac{t}{c} = \ 0.04 \qquad \qquad \frac{^Cf}{c} = \ NONE$

a, deg	CL	CD	C _M	cı	c _n	a, deg	C _L	$^{\rm C}_{\rm D}$	C _M	cı	c _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4955 3859 2675 1710 0833 0329 .0153 .0417 .0921 .1776 .2654 .4078 .6095 .7366 .6731					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 2 2 2 2 2 5	5973 4396 3278 2012 1428 0820 0286 .0224 .0944 .1503 .2869 .4023 .5787 .4148 .4731	.1097 .0571 .0281 .0115 .0076 .0040 .0031 .0019 .0052 .0076 .0232 .0473 .0992 .2210 .3604 .4581	.0248 .0026 -0105 -0148 -0089 -0063 .0078 .0176 .0208 .0191 .0087 -0115 .0548 -0204 -0337	0725 0524 0364 0226 0154 0028 0028 0028 .0109 .0177 .0330 .0480 .0712 .1055 .1168	.0139 .0074 .0043 .0024 .0018 .0014 .0009 .0007 .0012 .0023 .0045 .0078 .0155 .0496 .0596
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5744 4069 2872 1893 1327 0849 0261 .0131 .0609 .1131 .2089 .3177 .4874 .6984 .7746	.0909 .0481 .0294 .0231 .0187 .0187 .0187 .0220 .0242 .0374 .0616 .1123 .2230 .3198 .3884	.0009 -0284 -0227 -0178 -0154 -0136 -0046 -0063 .0024 .0015 .0101 .0146 -0507 -0980 -0971	0701 0464 0327 0211 0149 0111 0036 .0023 .0078 .0140 .0264 .0396 .0611 .0891 .0941	.0136 .0075 .0043 .0028 .0021 .0016 .0016 .0016 .0017 .0022 .0047 .0076 .0146 .0265 .0337 .0498	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6342 4608 3302 2043 1354 07184 0714 0499 1116 1686 3183 4247 8979 1- 0713 1- 1497	.1227 .0672 .0380 .0190 .0126 .0102 .0072 .0094 .0116 .0160 .0350 .0584 .1125 .2394 .4007 .5549	.0504 .0211 .0009 .0145 .0120 .0100 .0029 .0103 .0029 .0103 .0029 .0133 .0438 .0812 .1218	0766 0537 0537 0225 0150 0081 0014 0067 0135 0207 0373 0514 0757 1117 1369 1449	*0155 *0081 *0041 *0019 *0012 *0009 *0007 *0009 *0016 *0026 *0055 *0086 *0173 *0354 *0556 *0725
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 5891 - 4340 - 3015 - 2037 - 1388 - 0827 - 0251 0165 0723 1270 - 2480 - 3635 - 5433 - 6998 - 7707 - 7825	.0918 .0433 .0199 .0097 .0062 .0044 .0037 .0025 .0090 .0090 .0090 .0446 .0948 .1961 .1924	.0020 -0196 -0165 -0091 -0085 -0063 -0018 .0041 .0119 .0226 .0253 -0890 -0751	0692 0488 0336 0213 0146 0081 0027 0029 .0092 .0159 .0298 .0441 .0665 .0878 .0952 .0974	.0131 .0072 .0041 .0022 .0015 .0012 .0010 .0009 .0011 .0017 .0043 .0072 .0142 .0284 .0393 .0488	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	6553 4641 3390 2207 1502 0887 0205 0387 1160 1797 3185 	.1306 .0713 .0433 .0251 .0188 .0146 .0117 .0126 .0159 .0196 .0370 .0613 .1183 .2590 .5930	.0689 .0324 .0161 .0050 .0025 -0017 -0028 -0019 .0008 -0033 -0116 -0244 -0549 -11090 -1492 -1942	0752 0526 0375 0233 0155 0088 0017 00138 .0212 .0368 .0509 .0751 .1142 .1432 .1553	**************************************
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	.0794 .1445 .2747 .4061	.0070		0717 0519 0361 0223 0148 0089 0024 .0034 .0099 .0174 .0326 .0480 .0693 .1027 .1066	.0137 .0079 .0049 .0027 .0017 .0013 .0013 .0015 .0050 .0086 .0156 .0326 .0445	-7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20		.1225 .0670 .0391 .0229 .0177 .0142 .0122 .0113 .0162 .0216 .0382 .0646 .1198 .2569 .4362 .6246	.0709 .0332 .0171 .0069 .0031 .0003 -0010 0028 0038 0028 0136 .00282 0593 1113 1620	0091 0017 .0061 .0133 .0204 .0350 .0507 .0728 .1103	.0113 .0052 .0018 .0000 0008 0012 0014 0009 .0000 .0010 .0036 .0061 .0127 .0314 .0535 .0786

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{t}{c} = \text{ 0.04} \qquad \frac{c_f}{c} = \text{ 0.10}$

a, deg	CL	CD	C _M	c,	C _n	a, deg	c ^r	c _D	C _M	cı	c _n
		м	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 0 1 2 3 5 7 10 10 15 20 25	2775 2032 1093 0109 .0262 .0699 .1093 .1639 .1945 .2447 .3496 .4370 .5856 .7539 .8303 .7473					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4587 2851 1674 0322 -0434 -1091 -1736 -2393 -3075 -3744 -5232 -6447 -8033 -10166 1-0414	.0884 .0436 .0234 .0140 .0131 .0152 .0247 .0324 -1116 .0689 .1015 .3024 .4280 .5316	0492 0767 0881 0987 1035 1030 0955 0936 0940 0988 1610 1186 1376 1955	0551 0320 0164 0009 .0073 .0151 .0226 .0301 .0367 .0451 .0630 .0784 .1004 .1316 .1316	.0132 .0080 .0064 .0051 .0058 .0073 .0086 .0073 .0086 .0099 .0135 .0181 .0272 .0467
		М	≈ 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3578 - 2169 - 1063 - 0054 - 0054 - 0954 - 1453 - 1453 - 2429 - 3014 - 4023 - 5226 - 8240 - 8479 - 8067	0256 0124 -1546 00059 0085 0113 0150 00124 0245 0362 00618 0939 1572 2752 2752 4458	0698 1011 1029 0885 0890 0879 0825 0806 0783 0752 0679 0546 0663 1483 1489	-0433 -0304 -0089 -0026 -0094 -0150 -0206 -0268 -0331 -0398 -0530 -0674 -0888 -1089 -1162 -1063	0126 0079 00579 0041 0039 0043 0050 0069 0087 0128 0159 0248 0206 0262 0307	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5336 3415 2077 0771 .0036 .0711 .1328 .2170 .2846 .3557 .5039 .8252 1.0908 1.2473. 1.2046	.1059 .0618 .0373 .0250 .0210 .0213 .0242 .0286 .0373 .0461 .0709 .1767 .3335 .4934 .6135	0122 0485 0669 0801 0905 0948 0948 0970 1025 1152 1319 1564 1847 2087	0624 0387 0210 0063 .0036 .0180 .0180 .0273 .0342 .0432 .0603 .0764 .1007 .1381 .1565 .1511	*0155 *0094 *0069 *0054 *0059 *0053 *0069 *0080 *0095 *0136 *0181 *0272 *0479 *0670 *0774
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	- 4020 - 2356 - 1178 - 0147 - 0589 1104 1723 2253 2915 3534 4667 5816 7539 8393 8775 8628	.0558 .0218 .0105 .0090 .0102 .0102 .0144 .0211 .0290 .0373 .0618 .0908 .1543 .2628 .3722 .4561	0643 0992 0992 0883 0867 0857 0857 0857 0753 0654 0738 1350 1593 1598	0475 0257 0109 .0016 .0088 .0151 .0220 .0290 .0353 .0430 .0578 .0726 .0726 .0949 .1072 .1112	.0119 .0081 .0082 .0045 .0039 .0047 .0053 .0066 .0082 .0094 .0120 .0163 .0255 .0390 .0512 .0619	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	5561 3609 2179 0942 0193 .0454 .1101 .1736 .2508 .3178 .4653 .6061 .7945	.1125 .0659 .0419 .0291 .0260 .0254 .0268 .0302 .0379 .0457 .0725 .1091 .1775 .3349	.0081 -0302 -0541 -0684 -0752 -0809 -0857 -0906 -1081 -1267 -1587 -1969	0654 0405 0236 0004 0004 0069 0148 0224 0293 0374 0549 0713 0961 1333	*0135 *0071 *0045 *0040 *0032 *0034 *0045 *0059 *0078 *0120 *0139 *0226 *0437
		М	= .0.90					М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	0260 .0468 .1013 .1689 .2338 .2988 .3638 .5067 .6301 .7873 .9042	.0103 .0121 .0169 .0249 .0307 .0387 .0648 .0972 .1616 .2766	0659 0814 0943 0940 0935 0932 0932 0877 0838 0889 0895 1443 1820	0516 0305 0148 0006 .0073 .0144 .0219 .0296 .0363 .0443 .0617 .0773 .0985 .1143 .1202	0122 0080 0062 0048 0056 0073 0085 0077 0139 0186 0266 0415 0574	-1 0 1 2 3 5 7	5409 3693 2240 1093 0240 .0295 .1508 .2382 .3005 .4349 .5704 .7539 1.0315	.1037 .0591 .0392 .0258 .0241 .0228 .0263 .0291 .0403 .0484 .0747 .1075 .1790	1219 1553		

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c}{c} = 0.20$

a, deg	c _r	CD	CM	cı	Cn	a, deg	CL	C _D	C _M	cı	c _n
		М =	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2164 1027 0109 .0830 .1333 .1704 .2141 .2797 .3015 .3518 .4392 .5375 .6730 .8194 .8806 .7888					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3739 1981 0520 .0718 .1498 .2229 .2860 .3442 .4160 .4804 .6265 .7379 .8865 1.0474 1.0771	.0935 .0524 .0340 .0290 .0311 .0357 .0453 .0560 .0655 .0935 .1285 .1285 .1285 .1285 .1285 .1285 .1285	0914 1149 1281 1373 1412 1459 1332 1290 1388 1404 1494 1555 2013	0418 0188 0019 .0124 .0201 .0279 .0352 .0418 .0498 .0573 .0751 .0892 .1108 .1349 .1341	0102 0055 0038 0038 0047 0054 0064 0085 0102 0148 0204 0299 0475
		М :	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2656 1051 .0044 .1065 .1664 .2070 .2634 .3067 .3501 .4075 .6244 .7669 .8931 .8953 .8411	.0475 .0208 .0171 .0197 .0223 .0267 .0330 .0384 .0479 .0596 .0837 .1168 .1786 .2942 .3891 .4574	0836 1136 1109 1077 1052 1037 0910 0960 0951 0888 0774 0733 0752 1291 1549	0304 0099 .0033 .0148 .0210 .0266 .0326 .0380 .0436 .0501 .0633 .0776 .0970 .1135 .1118	.0067 .0039 .0024 .0023 .0020 .0028 .0035 .0047 .0056 .0067 .0103 .0158 .0253 .0410 .0512	-10 -7 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	4346 2534 1089 0403 1220 2013 2759 3386 4121 4772 6134 7341 9070 1- 1201 1- 2930	1098 0690 0487 0385 0375 0391 0443 0501 0588 0696 1359 2079 3517 5253		0490 0252 0075 .0088 .0180 .0264 .0343 .0413 .0492 .0566 .0727 .0871 .1103 .1419 .1599	*0121 *0068 *0050 *0041 *0039 *0041 *0050 *0062 *0082 *0082 *0099 *0144 *0197 *0300 *0511 *0723
		М	= 0.80					M	1 = 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2935 1155 .0096 .1089 .1714 .2244 .2855 .3406 .3870 .4532 .5694 .6930 .8446 .8917 .9152 .8887	.0597 .0285 .0196 .0203 .0228 .0278 .0352 .0391 .0466 .0578 .0818 .1154 .1788 .2837 .3936	0948 1238 1199 11921207 1186 1108 1065 1060 0985 0907 0867 0924 1430 1628	0325 -0104 .0039 .0156 .0227 .0352 .0415 .0469 .0541 .0681 .0848 .1047 .1116 .1138	.0064 .0039 .0024 .0024 .0027 .0034 .0040 .0053 .0061 .0078 .0123 .0178 .0274 .0401 .0514	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4637 2676 1213 .0091 .0873 .1565 .2506 .3016 .3810 .4410 .5782 .7082 .7082 .7098 .8798 1.1565	*1135 *0703 *0499 *0396 *0396 *0405 *0453 *0583 *0678 *0967 *1338 *2058 *3646	0415 0832 1048 1240 1354 1454 1459 1459 1505 1568 1689 1829 2195		*0113 *0062 *0041 *0035 *0034 *0054 *0071 *0092 *0130 *0182 *0276 *0494
		М	= .0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3335 1778 0286 .0795 .1531 .2245 .2790 .3439 .4065 .4685 .6152 .7346 .8591 .9811 1.0071	.0798 .0437 .0293 .0256 .0287 .0326 .0374 .0437 .0549 .0628 .0899 .1236 .1864 .3076 .4239 .5170	1024 1211 1265 1271 1277 1292 1286 1285 1192 1178 1157 1157 1506 1874 1840	0374 0162 .0000 .0128 .0201 .0278 .0348 .0422 .0487 .0561 .0738 .0886 .1083 .1240 .1240	.0083 .0051 .0037 .0034 .0042 .0047 .0059 .0077 .0094 .0143 .0397 .0287 .0442 .0566	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4572 2641 1255 .0055 .0775 .1495 .2116 .2815 .3568 .4288 .5565 .6787 .8446 1.1043	.1052 .0649 .0361 .0381 .0381 .0399 .0421 .0475 .0577 .0690 .0971 .1328 .2018	0773 0987 1167 1210 1259 1363 1361 1393 1527 1645 1787	.0043 .0121 .0199 .0265 .0343 .0419 .0505 .0654	.0091 .0046 .0032 .0027 .0027 .0029 .0038 .0048 .0064 .0082 .0120 .0120

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{E}{2} = 0.04$ $\frac{cf}{2} = 0.30$

α, deg	C _L	CD	C _M	cı	c _n	a, deg	c_{L}	CD	C _M	cı	C _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1093 0437 .0637 .0436 .1486 .1988 .2557 .3125 .3474 .3715 .4261 .5943 .7276 .8347 .9003 .7976					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2984 1065 .0452 .1647 .2495 .3194 .3776 .4395 .5076 .5782 .71131 .8147 .9360 .1068 1.06895	0755 0396 0284 0284 0334 0390 0478 0557 0780 1117 1486 2149 3507 4701	0992 1230 1359 1448 1524 1481 1505 1443 1370 1419 1458 1498 1514 1544 1911	0330 0090 .0081 .0220 .0304 .0379 .0455 .0524 .0603 .0693 .0853 .0999 .1187 .1424 .1360	*0111 *0069 *0059 *0060 *0070 *0082 *0097 *0118 *0139 *0190 *0238 *02493 *0603 *0669
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1734 -0336 .0813 .1843 .2428 .2851 .3338 .3775 .4346 .4823 .5961 .6937 .8281 .8931 .8910 .8498	.0171 .0043 .0022 .0069 .0113 .0165 .0241 .0330 .0431 .0544 .0843 .1194 .1827 .3018 .4030 .4724	0636 0917 0837 0818 0779 0762 0755 0691 05579 05579 0549 0577 1293 1178	0219 0026 .00105 .0217 .0281 .0340 .0400 .0464 .0526 .0592 .0725 .0858 .1049 .1154 .1131 .1075	.0085 .0052 .0044 .0050 .0057 .0065 .0078 .0098 .0113 .0141 .0199 .0298 .0429 .0528	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3611 1776 0059 .1385 .2368 .3043 .3659 .4381 .5032 .5684 .7033 .8170 .9709 1,2172 1.2646 1.2078	.0926 .0583 .0401 .0367 .0439 .0495 .0583 .0693 .0810 .1159 .1590 .2335 .3937 .5392 .6428	0741 1080 1358 1546 1584 1610 1659 1551 1574 1659 1741 1869 2048 2135 2250	-0396 -0158 -00158 -00194 -0291 -0366 -0439 -0591 -0675 -0833 -0984 -1200 -1523 -1595	*0137 *0090 *0070 *0070 *0076 *0070 *0076 *0082 *0099 *0117 *0139 *0238 *0337 *0530 *0747
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2081 0338 .0816 .1853 .2464 .3052 .4045 .4045 .4633 .5281 .6413 .7561 .8914 .9120 .9267 .8973	.0372 .0156 .0109 .0137 .0181 .0238 .0329 .0391 .0506 .0625 .0915 .1269 .1902 .3010 .4933	0863 1107 1064 1048 1005 1029 0877 0903 0828 0805 0862 1315 1447 1468	0280 0029 .0105 .0228 .0306 .0358 .0425 .0488 .0551 .0629 .0783 .0928 .1102 .1156 .1160	.0077 .0047 .0039 .0044 .0052 .0065 .0075 .0083 .0095 .0113 .0161 .0220 .0313 .0421 .0507 .0603	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	3776 1871 0397 . 0964 . 1871 . 2687 . 3356 . 4014 . 4739 . 5408 . 6689 . 7823 . 9501 1. 2109	. 0929 . 0579 . 0435 . 0388 . 0390 . 0497 . 0572 . 0825 . 1154 . 1578 . 2375 . 4048	-0579 -1017 -1190 -1377 -1480 -1528 -1604 -1633 -1560 -1678 -1763 -1763 -1763 -1940 -2258	0418 0177 0005 .0145 .0240 .0323 .0409 .0488 .0557 .0643 .0793 .0874 .1156 .1493	*0115 *0076 *0063 *0059 *0064 *0066 *0073 *0094 *0112 *0153 *0194 *0290 *0491
		М :	=.0.90					М =	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2530 0714 .0616 .1719 .2530 .3049 .3633 .4320 .4865 .5553 .6928 .7940 .9159 .01145 1.0171	0599 0293 0217 0239 0278 0322 0498 0599 0717 1030 1382 2042 3267 4402	-1073 -1256 -1286 -1330 -1354 -1324 -1292 -1174 -1180 -1198 -1166 -1246 -1448 -1714 -1675	0281 0055 .0093 .0220 .0301 .0368 .0440 .0516 .0579 .0667 .0834 .0980 .1157 .1283 .1256	.0093 .0062 .0050 .0056 .0067 .0072 .0081 .0098 .0114 .0138 .0187 .0229 .0318 .0455 .0558	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	3819 1964 0360 .0873 .1746 .2401 .3023 .3721 .4441 .5074 .6460 .7573 .9188 1.1654	0894 0558 0410 0384 0410 0445 0483 0574 0692 0821 1159 1600 2420	0566 0986 1181 1341 1421 1504 1548 1520 1591 1646 1777 1896 2275	0184 0012 .0131 .0224 .0290 .0371 .0445	.0076 .0042 .0034 .0035 .0040 .0049 .0059 .0074 .0088 .0120 .0154 .0236 .0422

TABLE 2 .- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \qquad \frac{c_f}{c} = 0.40$

a, deg	¢ ^r	C _D	C _M	cı	C _n	α, deg	C _L	C _D	C _M	cı	C _n
		М =	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	0329 .0394 .1468 .2279 .2761 .3133 .3506 .4009 .4338 .4776 .5631 .6748 .7887 .9158 .9290 .8457					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	22170286 -1280 -2559 -3329 -3950 -4509 -5068 -5839 -6410 -7528 -8522 -9590 1-1081 1-1130 1-0708	.0856 .0550 .0443 .0467 .0534 .0596 .0681 .0776 .0861 .0963 .1267 .0825 .1137 .0911 .1237	1403 1685 1779 1815 1837 1788 1778 1778 1707 1675 1621 1638 1565 1478 1772 1635	0287 0055 .0119 .0261 .0346 .0414 .0482 .0560 .0635 .0714 .0861 .0999 .1157 .1376 .1327	.0055 .0015 .0007 .0006 .0012 .0023 .0034 .0048 .0077 .0103 .0154 .0213 .0308 .0251 .0312 .0352
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-1250 0250 1337 2261 2816 3272 3783 4273 4675 5197 6349 7480 8654 9197 9263 8871	.0267 .0161 .0176 .0252 .0294 .0391 .0498 .0615 .0722 .0883 .1202 .1524 .2140 .3251 .4203	1009 1220 1213 1133 1097 1047 1036 0953 0993 0894 0811 0997 1490 1669 1633	0244 -0058 -0089 -0213 -0277 -0345 -0424 -0503 -0564 -0640 -0787 -0924 -1069 -1089 -1065 -1023	0016 0043 0032 0008 .0006 .0017 .0056 .0111 .0146 .0183 .0273 .0371 .0461 .0466 .0477 .0561	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2924 0874 0850 2217 3161 3732 4409 55003 5681 6370 7678 8771 1. 0292 1. 2027 1. 3454 1. 1932	.0979 .0657 .0567 .0517 .0549 .0613 .0693 .0777 .0906 .1029 .1388 .1835 .2630 .3940 .5845	- 1143 - 1538 - 1791 - 1894 - 1915 - 1909 - 1895 - 1835 - 1835 - 1879 - 1922 - 2009 - 2042 - 2359 - 2423	0368 -0115 -0071 -0227 -0317 -0389 -0448 -0270 -0309 -0349 -0427 -0999 -1204 -1450 -1432	.0073 .0033 .0019 .0015 .0016 .0019 .0031 .0046 .0067 .0089 .0143 .0201 .0320 .0522 .0743 .0769
		М	= 0.80					ŀ	1 = 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-1564 0148 1299 2457 3011 3490 4177 4664 5106 6833 8088 9150 9475 9534	.0443 .0244 .0236 .0298 .0370 .0453 .0527 .0599 .0733 .0965 .1161 .1532 .227 .3208 .4283 .5109	-1045 -1360 -1360 -1338 -1295 -1280 -1125 -1122 -1167 -1121 -1053 -1105 -1108 -1724 -1707	0240 0034 0105 0238 0310 0376 0340 0517 0654 0799 0949 1084 1088	0004 -0019 -0022 -0008 0003 0016 0044 0057 0166 0213 0325 0433 0499 0383	-10 -5 -3 -2 -1 0 1 2 3 5 7 10 15	3003 1069 -0410 -1866 -2708 -3447 -4755 -5495 -6166 -7372 -8509 1.0011	. 0970 . 0658 . 0546 . 0529 . 0554 . 0602 . 0685 . 0778 . 0887 . 1035 . 1384 . 1818 . 2629 . 4364	-1031 -1439 -1644 -1792 -1883 -1871 -1883 -1865 -2893 -1929 -2022 -2182 -2468	- 0 382 - 0 102 0 0122 0 1187 0 268 0 0356 0 0429 0 0513 0 0666 0 0815 0 0956 1 1174 1 1481	*0052 *0019 *0007 *0003 *0010 *0016 *0031 *0050 *0069 *0120 *0175 *0289 *0516
		м	=.0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-1810 .0020 .1455 .2617 .3386 .3946 .4506 .4987 .5508 .6094 .7425 .8285 .9454 .0652 1.0443 .9975	.0689 .0417 .0371 .0426 .0481 .0557 .0647 .0724 .0794 .1233 .1569 .2216 .3522 .4675 .5572	1426163316281670161916231602143414401386137215541927	0250 0028 .0125 .0269 .0343 .0415 .0547 .0607 .0685 .0844 .0972 .1138 .1300 .1225 .1193	.0035 .0005 -0001 -0001 .0007 .0015 .0028 .0074 .0092 .0137 .0185 .0568 .0890 .0564	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	3033 1117 -0372 -1620 -2507 -3186 -3920 -4522 -5288 -5934 -7117 -8277 -9722 1-2175	.0902 .0616 .0511 .0511 .0546 .0592 .0684 .0773 .0888 .1042 .1421 .1869 .2692	0976 1387 1559 1717 1753 1804 1802 1826 1871 1918 2044 2190 2544	0389 0150 .0014 .0163 .0247 .0321 .0409 .0485 .0561 .0640 .0784 .0930 .1133 .1432	.0028 0003 0010 0010 0003 .0002 .0006 .0013 .0034 .0049 .0087 .0140 .0242 .0470

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{^c f}{c} = \text{NONE}$

a, deg	C ^T	CD	c_{M}	cı	Cn	a, deg	C _L	CD	C _M	cı	C _n
		м	= 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4485 3405 2484 1620 1296 0864 0378 .0165 .0540 .1080 .2214 .3078 .4590 .6426 .7452					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5376 3822 2871 1840 1301 0666 0143 0523 1078 1649 2680 3822 5376 7962 1-0023 1-0309	.1123 .0600 .0390 .0251 .0219 .0193 .0155 .0181 .0219 .0257 .0406 .0647 .1132 .2309 .3860 .5132	.028800080098006300490028 .0028 .0042 .0098 .0112 .00080260096219582379	-0643 -0443 -0193 -0123 -0054 -0011 -0089 -0146 -0212 -0342	01330068003100020022
		М	= 0.60					М	= 1.00		
-10 -7. -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5027 3555 2610 1638 1111 0667 0111 .0417 .0861 .1361 .2444 .3527 .5110 .7109 .7665 .7637	•1094 •0533 •0383 •0244 •0217 •0139 •0139 •0139 •0139 •0139 •0289 •0422 •2005 •3144 •3905	.0024 0062 0073 0087 0038 0024 .0013 .0000 .0013 .0038 .0024 .0013 0147 1069 1782	0587 0391 0269 0162 0101 0047 .0020 .0094 .0155 .0202 .0303 .0437 .0903 .0944	0074 0039 0007 .0029 .0036 .0029 .0036 .0042 .0048 .0042 .0007 0236 0333	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6184 4467 3252 2097 1459 0122 0547 1170 1914 3054 4305	.1346 .0808 .0553 .0395 .0343 .0298 .0277 .0298 .0322 .0395 .0559 .0559 .01367 .2683 .4409	.0760 .0410 .0242 .0141 .0107 .0053 .0013 .0007 -0047 -0162 -0329 -0699 -1506 -2178 -2763	-:0723 -:0513 -:0369 -:0221 -:0151 -:0081 :0000 :0085 :0147 :0240 :0387 :0539 :0763 :1147 :1505	-:0163 -:0090 -:0044 -:0012 -:0004 :0018 :0021 :0019 :0014 -:0009 -:0074 -:0242 -:0484
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5343 3875 2765 1750 1204 0677 0075 .0489 .0978 .1524 .2558 .3819 .5362 .7724 .7713 .7976	.1016 .0500 .0297 .0184 .0158 .0120 .0128 .0214 .0184 .0278 .0482 .0952 .2111 .3145 .4116	.0125 0116 0099 0092 0066 0033 0026 .0009 .0059 .0059 .0066 0132 0924 1615 1806	0616 0438 0297 0402 0110 0046 .0023 .0082 .0137 .02201 .0320 .0479 .0676 .0913 .0959 .1009		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6217 4539 3371 2101 1445 00744 0058 1255 1897 3123 34320 6144 9135 1-1587 1-2725	.1363 .0826 .0575 .0423 .0359 .0339 .0330 .0359 .0432 .0674 .0674 .0846 .1392 .2726	.0942 .0569 .0342 .0207 .0142 .0103 .0051 .0007 -0046 -0103 -0426 -0781 -1608 -2299 -2853	-0705 -0514 -0365 -0223 -0149 -0071 .0011 .0088 .0163 .0234 .0379 .0531 .0744 .1116 .1438 .1594	-*0171 -*0100 -*0054 -*0004 *0007 *0014 *0014 *0010 *0005 -*0012 -*0077 -*0248 -*0725
		М :	= .0.90					M =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5448 3999 2966 1816 1233 0616 0133 .05500 .1066 .1649 .2732 .3899 .7631 .8697 .9230	.1050 .0550 .0150 .0190 .0163 .0147 .0130 .0180 .0230 .0353 .0556 .1899 .2173 .3522 .4702	0259 0008 -0096 -0088 -0073 -0029 0067 0096 0103 -0023 -0199 -0766 -1798 -2094	0631 0445 0320 0182 0121 0049 .0012 .0081 .0150 .0214 .0340 .0485 .0691 .0983 .1072 .1132	-0138 -0062 -007 -0004 -0006 -0025 -0025 -0033 -0031 -0016 -0033 -0171 -0349 -0510	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	6119 4491 3284 2021 1417 0758 0126 0589 1263 1881 3073 4322 6035 8897 1.1367 1.2658	.1401 .0848 .0573 .0415 .0351 .0298 .0312 .0345 .0393 .0567 .0822 .1353 .2610 .4348 .6169	.0937 .0552 .0354 .0223 .0162 .0162 .0068 .0007 .0044 0106 .0243 .0429 0800 .1590 2291 2800	0681 0494 0358 0221 0150 0068 .0000 .0072 .0153 .0221 .0361 .0715 .1063 .1373 .1550	-0207 -0113 -0060 -0012 -0015 0005 00012 0008 0005 -0010 -0067 -0224 -0455 -0689

Table 2.- The Aerodynamic Characteristics of the Aspect Ratio 2 model - Continued $\frac{t}{c} = 0.06 \qquad \qquad \frac{c_f}{c} = 0.20$

a, deg	c ^r	, C _D	СМ	cı	c _n	a, deg	CL	C _D	C _M	cı	c _n
		м -	0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1252 0653 .0109 .1034 .1469 .1905 .2394 .2830 .3156 .4408 .5387 .6584 .7945 .8217					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3692 2254 0959 .0479 .1247 .1838 .2397 .3037 .3644 .4267 .5354 .6457 .7895 .9653 1.0708	.0965 .0559 .0377 .0284 .0297 .0323 .0355 .0432 .0498 .0588 .0809 .1170 .1768 .2979 .4481	0474 0721 0969 1132 1160 1181 1181 1216 125 1286 1358 14640 1903 2552 2821	0407 0233 0070 .0097 .0175 .0240 .0307 .0372 .0446 .0520 .0648 .0788 .0788 .0788 .0962 .1203 .1268	-0095 -0039 -0004 -0007 -0007 -0005 -0002 -0015 -0032 -0071 -0143 -0143
		м	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2016 0784 .0196 .1176 .1792 .2240 .2632 .3135 .3611 .4059 .4871 .5991 .7335 .8342 .8566	0633 0246 0123 0140 0151 0179 0246 0291 0342 0414 0565 0868 1501 2587 3651	-0719 -0954 -0867 -0867 -0891 -0856 -1003 -0990 -0979 -0954 -0941 -0941 -1028 -1635 -1969 -2280	0204 0048 .0068 .0177 .0245 .0306 .0340 .0414 .0449 .0476 .0585 .0713 .0877 .1012 .1026	0007 .0000 .0013 .0023 .0039 .0026 .0020 .0010 0003 0020 0052 0183 0332 0413	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4180 2603 1347 0046 0674 1501 2787 3353 3453 4042 5206 6461 8146 10626	.1093 .0723 .0723 .0527 .0438 .0413 .0429 .0453 .0511 .0579 .0677 .0903 .1286 .1286 .6673	0190 0508 0793 0799 1077 1151 1229 1320 1320 1531 1721 1721 1930 2418 2790	0468 0260 0111 0026 0115 0204 0279 0353 0409 0491 0621 0766 0785 1293 1524	0119 0057 0027 0005 0002 0004 0016 0029 0039 0084 0183 0785
		М	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2465 1043 0057 .1062 .1612 .276 .2788 .3167 .4210 .5158 .6296 .7567 .8382 .8704 .8761	.0664 .0326 .0243 .0607 .0243 .0372 .0372 .0488 .0709 .1009 .1009 .2666 .3759 .4646	0856 1065 1082 1098 1098 1082 1057 1057 1057 1048 1024 1167 1695 2189	0276 0083 .0032 .0152 .0216 .0267 .0391 .0451 .0506 .0612 .0750 .0916 .1036	0049 0018 0001 	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	4293 2587 1411 0088 .0529 .1235 .1823 .2499 .3146 .3822 .4998 .4998 .7880 1.0350 1.2261 1.3231	1120 0729 0541 0456 0435 0447 0529 0600 0694 0926 1273 1902 3311 5178 7013	-:0085 -:0481 -:0715 -:0994 -:0989 -:1054 -:1118 -:1203 -:1327 -:1509 -:1697 -:2029 -:2504 -:2972 -:3330	-:0464 -:0268 -:0125 :0018 :0104 :0175 :0239 :0314 :0389 :0735 :0928 :1245 :1456 :1609	0115 006 003 0012 0015 0022 0022 003 00174 005 0603 0603
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3107 - 1646 - 0470 0806 1461 1999 2570 3141 3678 4316 5341 6382 7541 9304 9741	.0769 .0403 .0272 .0238 .0249 .0329 .0396 .0464 .0561 .0769 .1115 .1676 .2832 .4155	0661 0966 1107 1166 1130 1130 1136 1166 1166 1241 1389 1612 2393 2526	.0452 .0522 .0636 .0775 .0925 .1199 .1158	0057 0024 .0006 .0014 .0014 .0008 .0006 0002 0006 0022 0053 0121 0283 0443	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4183 2572 1357 0113 .0509 .1159 .1724 .2459 .3166 .3731 .4918 .6190 .7830 1.0232 1.2254	*1133 *0715 *0520 *0438 *0418 *0430 *0367 *0458 *0557 *0667 *0890 *1244 *1843 *3219 *5045 *6894	0062 0419 0712 0888 0963 1013 1088 1157 1231 1313 1456 1682 1945 2451 2951	.1423	012: 007: 004: 001: 001: 001: 002: 003: 004: 005: 016: 036: 036:

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Continued $\frac{c_c}{c} = 0.006 \qquad \frac{c_p}{c} = 0.30$

α, deg	CT	CD	C _M	c,	C _n	a, deg	CL	CD	C _M	cı	C _n
		М	= 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1089 0109 .0708 .1634 .2015 .2559 .2995 .3321 .3866 .4247 .5009 .6044 .7405 .8494 .8715					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2939 1342 0096 .1326 .2012 .2699 .3306 .3329 .4536 .5175 .6213 .7267 .8752 1.0541 1.1627	.0936 .0549 .0425 .0383 .0425 .0441 .0502 .0588 .0674 .0776 .1038 .1437 .2035 .3348 .4932 .6191	0834 1131 1301 1427 1497 1541 1541 1526 1541 1681 1681 1682 2035 2636	0349 0140 .0000 .0155 .0233 .0314 .0384 .0450 .0523 .0717 .0853 .0277 .1279 .1384	007/ 002/ 000/ 001/ 000/ 000/ 002/ 004/ 009/ 018/ 071/
		М	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 1540 - 0224 0812 1708 2240 2744 3332 3724 4173 4649 6581 - 7925 8709 8989 8625	.0661 .0302 .0218 .0190 .0207 .0274 .0342 .0370 .0498 .0672 .0952 .1557 .2711 .3842 .4598	0793 1015 0966 1028 1004 0916 0930 1028 0916 0966 0842 1004 1709 2229	0204 0027 0102 0204 0265 0319 0428 0428 0432 0632 0748 0917 1019 1019 0972	0026 0010 0003 .0007 .0003 0003 0007 0007 0007 0010 0039 0108 0248 0381 0476	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3549 1897 0642 0918 1683 2432 3090 3793 4436 5124 6134 7403 8994 1. 1380 1. 3124 1. 3277	.1046 .0691 .0557 .0480 .0541 .0578 .0661 .0743 .0872 .1120 .1557 .2233 .3723 .5552	-0582 -0880 -1137 -1340 -1442 -1516 -1591 -1624 -1651 -1746 -1848 -1996 -2220 -2626 -2964 -3357	0408 0212 0074 0111 0197 0271 0345 0423 0497 0575 0705 0854 1040 1337 1578	
		М	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 1821 - 0436 - 0645 - 1707 - 2295 - 2864 - 3357 - 4438 - 4474 - 5860 - 7055 - 8287 - 9254 - 9368 - 9254	0577 0288 0243 0250 0269 0300 0364 0440 0588 0793 1130 1726 2852 4980		0230 0046 .0078 .0203 .0272 .0336 .0387 .0460 .0511 .0562 .0677 .0819 .0985 .1105 .1086 .1082	0024 -0005 -0016 -0006 -0006 -0006 -0005 0005 0029 0071 0146 0293 0437 0558	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3776 1925 0749 .0690 .1454 .1998 .2733 .3438 .4084 .4745 .5891 .7067 .8785 1.1077 1.2870 1.3927	.1070 .0702 .0570 .0491 .0500 .0447 .0549 .0643 .0729 .0861 .1134 .1516 .2210 .3743 .5577 .7631	0442 0799 1054 1254 1339 1417 1641 1716 1859 2002 2230 2230 2639 3106 3509	0410 0217 0089 .0075 .0160 .0232 .0125 .0374 .0453 .0531 .0663 .0810 .1009 .1302 .1533 .1676	0099 0051 0019 0005 0004 0021 0021 0031 0063 0197 0440 0912
		М :	= 0.90					М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2493 0920 .0234 .1474 .2109 .2661 .3247 .3835 .4505 .5087 .6091 .7146 .8434 1.0041 1.0242	.0773 .0418 .0298 .0298 .0338 .0378 .0445 .0519 .0609 .0733 .0954 .1332 .1901 .3119 .4428 .5529	10071206128112811296134013171347135513171466176224432613	0305 0106 .0041 .0175 .0240 .0305 .0370 .0443 .0516 .0589 .0707 .0841 .0999 .1219 .1198	0041 0010 .0014 .0016 .0006 .0000 0004 0014 0019 0043 0084 0160 0323 0487 0636	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3589 1808 0650 0650 0692 1356 2006 2600 3292 3843 4479 5651 6909 8449 1.0709 1.2546 1.3676	.1085 .0687 .0543 .0480 .0480 .0480 .0548 .0633 .0709 .0814 .1085 .2139 .3628 .5462 .7533	0413 0818 1031 1206 1300 1312 1456 1559 1643 1788 1894 2175 2581 3038	0405 0209 0075 .0075 .0148 .0223 .0288 .0363 .0429 .0504 .0634 .0778 .0957 .1238 .1464	0120 0064 0036 0012 0020 0033 0033 0051 0061 0077 0137 0222 0414 0660 0936

TABLE 2.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 2 MODEL - Concluded $\frac{t}{c} = \text{ 0.06} \qquad \frac{c_f}{c} = \text{ 0.40}$

a, leg	c _L	CD	C _M	cı	Cn	a, deg	CL	CD	C _M	cı	Cn
		M =	0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1077 .0000 .0916 .1886 .2370 .2694 .3235 .3609 .4040 .4418 .5387 .6411 .7650 .8515 .8727					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2504 0829 .0447 .1643 .2265 .2823 .3429 .4099 .4626 .5343 .6300 .7369 .8773 1.0591 1.1261	.0785 .0456 .0345 .0345 .0376 .0440 .0501 .0581 .0689 .0817 .1097 .1474 .2166 .3452 .4941 .6214	0974 1256 1411 1447 1481 1517 1539 1539 1743 1743 1905 2047 2047 20660 2964	0290 0085 .0070 .0197 .0271 .0333 .0399 .0472 .0538 .0616 .0743 .0879 .1045 .1289 .1347 .1312	0052003200340043005000570067008001130123023203970734
		М =	0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	-1448 -0139 -0119 1866 2423 2785 3342 3844 4317 4735 5905 6824 8025 8468 8746	.0479 .0206 .0011 .0167 .0189 .0273 .0340 .0412 .0479 .0668 .1003 .1616 .2808 .3972 .4657	0838 0876 0900 0911 0925 0862 0925 0925 0925 0925 0925 1110 1861 2280 2317	0176 -0027 -0095 -0196 -0284 -0338 -0379 -0426 -0500 -0534 -0656 -0784 -0940 -1001 -1014 -0919	0039 0039 0036 0032 0023 0023 0029 0032 0036 0045 0065 0094 0104 0233 0376	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3102 1329 -0000 -1406 -2185 -2781 -3515 -4233 -4691 -5348 -6448 -7488 -8924 1,1094 1,2652 1,2469	.0947 .0617 .0480 .0452 .0452 .0526 .0571 .0660 .0752 .0902 .1201 .1608 .2329 .3802 .5486	0730 1109 1339 1521 1575 1649 1656 1676 1744 1825 1961 2197 2568 3380	0360 0148 .0011 .0178 .0260 .0323 .0397 .0471 .0542 .0620 .0742 .0875 .1057 .1339 .1498	0076 0041 0048 0059 0068 0076 0083 0014 0151 0197 02916 0725 0888
		М :	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1717 0245 .0830 .1886 .3508 .4055 .4489 .5036 .6017 .7168 .8394 .8696 .992 .8884	.0483 .0249 .0215 .0249 .0298 .0351 .0419 .0483 .0573 .0668 .0909 .1279 .1894 .2950 .4991	1002 1109 1127 1127 1127 1102 1109 1109 1059 1043 1068 1160 1820 2187 2270	0197 -0019 -0019 -0220 -0302 -0357 -0417 -0476 -0540 -0586 -0705 -0851 -0998 -1062 -1062 -1064		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3155 1468 0220 .1248 .1981 .2495 .3185 .3875 .4506 .5019 .6238 .7456 .9011 .1242 1.2651 1.3649	.0925 .0608 .0505 .0476 .0505 .1993 .0619 .0722 .0793 .0910 .1227 .1632 .2339 .3883 .5630 .3666	-0701 -1026 -1266 -1448 -11532 -11571 -1624 -1720 -17720 -2012 -2259 -2695 -3052 -3506	-0360 -0160 -0021 -0142 -0221 -0278 -0353 -0435 -0502 -0570 -0712 -0848 -1019 -1322 -1528 -1642	0132 0087 0065 0066 0060 0072 0077 0092 0101 0152 0203 0203 0737 0986
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2204 0584 .0635 .1753 .2371 .2906 .3473 .4091 .4592 .5160 .6265 .7214 .8617 1.0153 1.0020 .9886	0738 0417 0344 0354 0401 0451 06534 06615 0691 1052 1429 2054 4502	1049 1256 1329 1329 1323 1335 1293 1293 1293 1293 1293 1293 1293 1352 1478 1832 2453	0239 0057 .0085 .0215 .0288 .0361 .0422 .0478 .0551 .0624 .0746 .0875 .1046 .1265 .1200	-0045 -0037 -0033 -0041 -0050 -0058 -0060 -0074 -0089 -0101 -0136 -0217 -0388 -0532 -0664	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3105 1440 0183 .1059 .821 .2399 .3063 .3613 .4319 .4998 .8609 1.0727 1.2279 1.3267	.0957 .0675 .0556 .0556 .0590 .0624 .0680 .0762 .0867 .0985 .1270 .1694 .2340 .3706 .5428	0656 1012 1249 1387 1468 1580 1617 1680 1735 1842 1999 2186 2591 3122 3435	- 0 353 - 0 168 - 0027 0 117 0 192 0 260 0 339 0 448 0 480 0 552 0 682 0 819 0 980 1 254 1 459 1 1579	0142 0093 0074 0074 0085 0093 0101 0131 0164 0229 048 0725

table 3.- the aerodynamic characteristics of the aspect ratio 3 model $\frac{t}{c} = \text{ 0.04} \qquad \frac{c_f}{c} = \text{ none}$

a, deg	C _L	CD	C _M	cı	Cn	a, deg	C _L	$^{\rm C}{}_{\rm D}$	C _M	cı	C _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5838 4338 3191 2104 1544 0956 0279 -0176 -0691 -1250 -2323 -3426 -5382 -6661 -6941 -6764					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7947 6088 4410 2879 2057 1218 0296 .0669 .1431 .2287 .4048 .5709 .7848	.1667 .0971 .0546 .0304 .0211 .0158 .0129 .0129 .0162 .0239 .0453 .0810 .1505 .2930	.0846 .0540 .0200 .0049 .0006 -0036 .0038 .0097 .0119 .0108 -00418 -0769 1140	0958 0726 0526 0326 0133 0030 .0073 .0163 .0270 .0479 .0689 .0955 .1305	0197 0114 0065 0025 0021 0019 0025 0036 0043 0079 0122 0238
	F 100	М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6694 5137 3711 2474 1746 1019 0335 .0291 .0975 .1673 .2983 .4264 .6039 .7334 .7421	.1170 .0601 .0322 .0204 .0162 .0140 .0122 .0162 .0218 .0373 .0633 .1224 .2269 .3070	.0142 -0208 -0196 -0084 -0066 -0035 -0007 -0123 -0235 -0071 -0691 -0869	0804 0580 0408 0263 0183 0115 0028 .0053 .0128 .0208 .0364 .0518 .0762 .0963 .0971	0156 0082 0047 0031 0024 0018 0017 0019 0026 0037 0055 0096 0181 0327	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	7981 5884 4382 2911 2034 1189 0219 .0782 .1721 .1721 .4163 .5571 .7668 1.0485	.1663 .0962 .0604 .0393 .0297 .0200 .0208 .0209 .0315 .0523 .0816 .1451 .2901	.1063 .0623 .0377 .0234 .0122 .0025 -0019 0058 0170 0368 0555 0956 1314	0918 0658 0491 0317 0120 0120 0022 .0085 .0193 .0291 .0481 .0639 .0889 .1272	.0190 .0209 .0071 .0043 .0027 .0025 .0029 .0039 .0050 .0084 .0127 .0222 .0452
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7036 5534 4131 2727 1878 1087 0395 0.296 .1127 .1917 .3498 .4961 .6818 .7669 .7767	1297 0695 0384 0223 0160 0131 0107 0102 0141 0190 0340 0613 1186 2221 3091	.0039 -0125 -0165 -0098 -0066 -0028 .0033 .0063 .0127 .0137 .0269 .0269 .0068 -0697 -0925	-0835 -0626 -0426 -0294 -0200 -0113 -0038 -0047 -0142 -0227 -0407 -0584 -0997 -0991	.0162 .0186 .0055 .0034 .0026 .0020 .0018 .0021 .0030 .0067 .0111 .0192 .0341 .0438 .0576	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7557 5592 4232 2811 1965 1058 0212 .0725 .1602 .2418 .4020 .5350 .7254	.1550 .0911 .0533 .0376 .0286 .0230 .0212 .0215 .0260 .0335 .0535 .0825 .1420	.0966 .0601 .0390 .0226 .0023 -00125 -00177 -01772 -0190 -0386 -0554 -0912	- 0865 - 0630 - 0468 - 0303 - 0208 - 0110 - 0040 0089 0180 0 0275 0 456 0 618 0 853	0174 0100 0060 0035 0018 0016 0023 0032 0043
		М	= 0.90					М :	1.10	-	
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7338 5755 4358 2963 2004 1220 0366 0488 1290 2266 4009 5438 7146 8245 8715 8820	.1444 .0823 .0458 .0258 .0258 .0116 .0094 .0085 .0116 .0172 .0386 .0707 .1294 .2418 .3403	0318 0112 -0037 -0101 -0106 -0056 0019 0095 0159 0179 0078 -0094 -0273 -0846 -1196 -1259	0903 0680 0494 0324 0215 0130 0039 .0064 .0148 .0254 .0469 .0659 .0896 .1054 .1082	0177 0099 0057 0033 0026 0020 0018 0021 0028 0038 0071 0117 0206 0354 0481	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7320 5417 4246 2782 1903 1083 0234 .0673 .1464 .3806 .5124 .6881	.1512 .0897 .0583 .0385 .0295 .0242 .0220 .0216 .0342 .0342 .0558 .0853 .1465		0838 0616 0456 0296 0201 0107 .0078 .0083 .0169 .0267 .0438 .0598 .0832	.0162 .0093 .0056 .0034 .0026 .0019 .0017 .0023 .0029 .0038 .0063 .0101

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.10$

C _L	, CD	СМ	cı	c _n	a, deg	cr	C _D	C _M	cı	C _n
	М =	0.40					м	= 0.95		
3945 2221 1125 0132 .0409 .0906 .1476 .1973 .2878 .3945 .5085 .6765 .7978 .7598					-10 -7 -5 -3 -2 -1 0 1 2 3 5	6736 4643 2844 1341 0523 .0589 .1602 .2420 .3564 .4381 .5984 .7291	.1520 .0864 .0515 .0342 .0285 .0253 .0314 .0369 .0406 .0522 .0836 .1206	.0242 -0214 -0593 -0850 -0934 -1109 -1137 -1185 -1179 -1250 -1377 -1475	0797 0532 0317 0127 0020 .0101 .0212 .0306 .0435 .0534 .0716 .0886	.0193 .0113 .0071 .0051 .0044 .0052 .0063 .0075 .0094 .0191
tea .	М =	0.60					м	= 1.00		
4583 2776 1403 0174 .0549 .1128 .1807 .2400 .3181 .3803 .5176 .6405 .7895 .8502 .8473 .8328	.0828 .0437 .0288 .0253 .0253 .0278 .0348 .0431 .0483 .0562 .0814 .1160 .1835 .2880 .3741	0647 0958 0956 0845 0845 0867 0764 0742 0719 0668 0527 0497 0756 1271 1383 1413	0544 0310 0135 .0004 .0089 .0158 .0234 .0314 .0399 .0472 .0633 .0798 .1012 .1129 .1106	.0126 .0073 .0048 .0040 .0040 .0042 .0048 .0059 .0074 .0087 .0114 .0163 .0255 .0391 .0496 .0601	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6488 4621 3112 1774 0918 0109 0794 1774 2738 3672 5493 6893	.1484 .0899 .06043 .0379 .0356 .0363 .0387 .0443 .0528 .0815 .1167	.0366 -0078 -00365 -0532 -0654 -00694 -0792 -0888 -0981 -1109 -1356 -1518	0134 0515 0334 0176 0074 0020 .0115 .0233 .0338 .0449 .0658 .0828	.0179 .0114 .0082 .0063 .0057 .0052 .0054 .0063 .0072 .0087 .0125 .0173
	М =	= 0.80					М	= 1.05		
5045 3278 1845 0394 -0354 -1139 -2022 -2670 -3494 -4378 -5791 -7185 -8598 -8520	.0939 .0488 .0273 .0200 .0188 .0205 .0278 .0296 .0382 .0478 .0715 .1062 .1704 .2733	0769 0946 1016 0947 0944 0962 0864 0919 0715 0718 0769 1409	0619 0381 0203 0038 0056 .0145 .0244 .0332 .0427 .0522 .0695 .0870 .1096 .1112	*0128 *0071 *0049 *0038 *0036 *0040 *0047 *0056 *0068 *0080 *0121 *0174 *0261 *0375	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	- 6371 - 4478 - 31863 - 1037 - 0120 0 0796 1548 2449 3351 5049 6446	.1434 .0890 .0699 .0462 .0403 .0373 .0388 .0406 .0466 .0565 .0842 .1186	.0351 -0071 -0320 -0456 -0580 -0645 -0731 -0808 -0878 -0981 -1246 -1473	0760 0508 0347 0182 0082 .0009 .0116 .0207 .0307 .0410 .0617 .0805	0156 0089 0058 0040 0040 0027 0036 0040 0053 0068 0105
	М	= 0.90					М	= 1.10		
- 5787 - 3846 - 2426 - 0866 0055 0918 1836 6 2824 3794 4608 6205 7467 9390	.1206 .0651 .0375 .0243 .0204 .0260 .0302 .0388 .0464 .0771 .1163 .1866	1027 1087 1232	.0548 .0741 .0922	.0156 .0086 .0057 .0043 .0039 .0042 .0048 .0059 .0074 .0090 .0135 .0191	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6145 4470 3174 1849 0291 0612 -1427 2359 3203 4732 6116		0264 0415 0570 0708 0881 1184	.0000 .0097 .0200 .0292 .0395 .0583	.0136 .0075 .0044 .0027 .0020 .0021 .0039 .0042 .0054 .0082
	3945222111250132 .0409 .0906 .1476 .1973 .2440 .2878 .7978 .759827761403 .7598277614128 .1807 .2400 .3181 .3803 .5176 .6405 .7895 .8502 .8473 .832850453278 .832850453278 .8502 .8473 .8328	M =	M = 0.40 3945222111250132 .0409 .0906 .1476 .1973 .2440 .2878 .3945 .5085 .6765 .7978 .7978 .7598 M = 0.60 4583 .082806472776 .04370958 .7978 .7598 M = 0.60 4583 .082806470776 .0174 .02530845 .09781128 .02780845 .0174 .02530845 .0174 .02530845 .0174 .02530845 .0183 .02780174 .2400 .431 .0742 .3181 .0483 .0719 .3803 .0562 .0668 .5176 .0814 .0527 .6405 .1160 .0947 .7895 .1835 .0756 .8502 .2880 .1271 .8473 .8378 .0488 .0944 .1139 .0255 .0868 .0944 .1139 .0205 .0949 .0354 .0188 .0944 .1139 .0205 .0949 .0354 .0188 .0944 .1139 .0205 .0949 .0354 .0188 .0944 .1139 .0205 .0949 .0354 .0188 .0944 .1139 .0205 .0949 .0354 .0188 .0944 .1139 .0205 .0962 .0278 .0864 .0971 .0975 .0865 .0771 .0715 .071	M = 0.40 3945222111250132 .0409 .0906 .1476 .1973 .2440 .2878 .3945 .5085 .6765 .7978 .7598 M = 0.60 4583 .0828 .99760135 .0174 .0253 .0847 .0174 .0253 .0845 .0064 .1128 .0278 .0849 .0054 .1128 .0278 .0849 .0064 .1128 .0278 .0849 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0253 .0847 .0174 .0240 .0431 .0742 .0318 .81807 .0348 .0764 .0234 .2400 .0431 .0742 .0314 .3181 .0483 .0719 .399 .3803 .0562 .0668 .0472 .0314 .3181 .0483 .0719 .399 .3803 .30562 .0688 .0472 .0314 .3181 .0483 .0719 .399 .3895 .1835 .0756 .1012 .8502 .2880 .1271 .1129 .8473 .3741 .1383 .1106 M = 0.80 5045 .0354 .0384 .0488 .0944 .056 .1139 .0205 .0947 .0038 .0354 .0188 .0944 .0056 .1139 .0205 .0962 .0145 .2022 .0278 .0849 .0944 .0056 .1139 .0205 .0962 .0145 .0204 .0311 .0283 .0344 .0382 .0849 .0427 .0938 .0944 .0956 .1139 .0205 .0918 .0990 5787 .1206 .0055 .0204 .1031 .0028 .0055 .0204 .1031 .0028 .0055 .0204 .1031 .0028 .0055 .0204 .1031 .0028 .0055 .0204 .1031 .0028 .0055 .0204 .1031 .0028 .0068 .0066 .0443 .0993 .0086 .0055 .0204 .1031 .0028 .00918 .0066 .0047 .00769 .0181 .0086 .00464 .1027 .0449 .07467 .1163 .1232 .0922	M = 0.40 3945222111250132 -0409 -0906 -1476 -1973 -2440 -2878 -3945 -5085 -6765 -7978 -7978 -7598 2776 -0437 -0998 -0310 -0073 -1403 -0288 -0976 -0135 -00437 -0198 -0310 -0073 -1403 -0288 -0976 -0135 -0043 -0174 -0253 -0845 -0084 -0074 -0554 -0253 -0845 -0084 -0074 -0549 -0253 -0845 -0084 -0074 -0549 -0253 -0845 -0084 -0074 -0549 -0253 -0845 -0084 -0074 -0384 -0764 -0234 -0049 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0776 -0348 -0378 -0388 -0378 -0388 -0378 -0388 -0378 -0388 -	M = 0.40 394522210132000900061476197324002878394522783945287839455988 M = 0.60 M = 0.80 M = 0.80 M = 0.80 M = 0.90 M = 0	- 3945 - 2221 2221 2644 - 2644 - 2624 - 2621 - 262	N = 0.40 N	M = 0.40 M = 0.40 M = 0.25 222111252121112521323032	M = 0.40

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.20$

deg	C ^L	CD	C _M	cı	Cn	a, deg	CL	СД	C _M	cı	C _n
		М	= 0.40					N	1 = 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3057 1254 0029 .1081 .1629 .2206 .2783 .3258 .4023 .4369 .5911 .6762 .8074 .8708 .8449 .8160					-10 -7 -5 -3 -2 -1 0 1 2 3 5	5765 3423 1809 .0129 .1179 .2228 .3246 .4231 .5167 .6071	*1362 *0770 *0501 *0362 *0342 *0354 *0409 *0480 *0580 *0706 *1056	0406 .2230 1155 1487 1631 1689 1713 1716 1707 1712 1845	0702 0399 0180 .0049 .0163 .0284 .0399 .0506 .0611 .0725 .0905	.0144 .0069 .0038 .0028 .0030 .0038 .0048 .0063 .0083 .0159
		М	= 0.60					М	= 1.00		
-10 -7 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3554 - 1513 0014 1327 2027 2027 2683 3325 982 4538 5323 4538 6494 7792 8934 9220 9077 8906	.0688 .0267 .0137 .0154 .0197 .0243 .0320 .0414 .0477 .0561 .0846 .1200 .1845 .2850 .3706 .4577	0808 1203 1212 11174 1072 0977 0946 0830 0577 0609 0965 1443 1471		.0056 .0009 -0001 .0015 .0043 .0067 .0089 .0112 .0137 .0195 .0263 .0335 .0405 .0405	-10 -7 -5 -3 -2 -1 0 1 2 3 5	5945 3871 2289 0615 .0307 .1352 .2842 .3656 .4701 .5531	.1420 .0873 .0608 .0446 .0408 .0400 .0405 .0571 .0691 .1024	.2813 0571 0848 1145 1271 1419 1645 1668 1747 1858	0699 0435 0239 0037 .0078 .0180 .0357 .0451 .0566 .0665	.0146 .0079 .0050 .0037 .0034 .0034 .0045 .0058 .0077 .0098
		М	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3741 - 1861 - 0233 - 1153 - 2045 - 2791 - 3547 - 4293 - 5040 - 5854 - 7520 - 8684 1.0079 - 9536 - 9575 - 9420	.08172 .0212 .01188 .0198 .0234 .0234 .0346 .0431 .0539 .0820 .1210 .1878 .1434 .1921 .2393	0904 1360 1379 1342 1350 1297 1246 1230 1156 1104 0964 0970 1047 1511 1486	0902 0392 0010 .0314 .0506 .0676 .0849 .0519 .0602 .0696 .1070 .1255 .1176 .1200 .1184	.0019 .0026 .0009 .0008 .0015 .0030 .0046 .0063 .0072 .0105 .0079 .0100 .0293 .0401 .0520 .0631	-10 -7 -5 -3 -2 -1 0 1 2 3 5	5814 3767 2254 0727 .0193 .1009 .2121 .3159 .4272 .5132 .6748	.1360 .0839 .0589 .0460 .0423 .0412 .0423 .0467 .0567 .05679	0138 0536 0808 1039 1160 1275 1400 1517 1626 1628 1826	0684 0420 0240 0054 .0051 .0150 .0276 .0390 .0516 .0615	.0134 .0073 .0044 .0031 .0029 .0031 .0040 .0052 .0071 .0088 .0137
		М	= 0.90					М =	: 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4911 2895 1164 .0565 .1591 .2533 .3422 .4261 .5442 .6331 .7803 .9241	.0570 .0307 .0175 .0128 .0128 .0143 .0169 .0202 .0261 .0329 .0480 .0690	0867 1176 1325 1473 1485 1517 1480 1454 1456 1456 1456	0606 0329 0107 .0093 .0201 .0305 .0415 .0519 .0640 .0758 .0941 .1101	.0092 .0051 .0024 .0019 .0022 .0029 .0040 .0055 .0080 .0104 .0155 .0219	-10 -7 -5 -3 -2 -1 0 1 2 3 5	5634 3665 2185 0819 .0144 .0934 .1983 .2989 .3967 .4858 .6467	.1301 .0809 .0576 .0446 .0417 .0403 .0435 .0474 .0562 .1018	0095 0504 0762 0958 1093 1205 1330 1465 1528 1627 1752	0657 0407 0227 0052 .0052 .0140 .0256 .0369 .0480 .0590 .0779	.0121 .0065 .0039 .0027 .0026 .0031 .0037 .0050 .0064 .0082

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.30$

α,	CT	CD	C _M	cı	C _n	a, deg	CL	CD	C _M	cı	Cn
leg		М =	0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2534 0576 .05504 .1656 .2232 .2750 .3441 .3888 .4391 .4895 .61119 .7343 .8207 .8639 .8236 .7861					-10 -7 -5 -3 -2 -1 0 1 2 3 5	4754 2659 0725 .1128 .2176 .3223 .4077 .4899 .5882 .6607 .8154	.1149 .0682 .0444 .0376 .0388 .0428 .0587 .0713 .0864 .1240	0709 1084 1404 1702 1802 1806 1820 1820 1823 1830 1937	0536 0259 0031 .0176 .0287 .0499 .0593 .0694 .0792 .0981	.0155 .0097 .0070 .0064 .0068 .0074 .0086 .0102 .0124 .0150 .0205
		М =	• 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2827 - 0705 0677 1901 2635 3255 4059 4515 5156 5726 8261 9059 9201 8745 8631	.0444 .0098 .0036 .0063 .0115 .0168 .0245 .0315 .0403 .0508 .0833 .1208 .1208 .1926 .2998 .3894 .4736	0774 1075 1049 0984 0962 0948 0956 0871 0822 0716 0693 1007 1384 1375	0323 0057 .0107 .0249 .0330 .0485 .0556 .0628 .0707 .0896 .1040 .1173 .1196 .1141	.0084 .0046 .0034 .0039 .0048 .0056 .0061 .0072 .0089 .0108 .0320 .0216 .0311 .0436 .0527	-10 -7 -5 -3 -2 -1 0 1 2 3 5	5014 2959 1288 .0414 .1457 .2683 .3649 .4492 .5412 .6164 .7819	.1203 .0743 .0531 .0434 .0422 .0441 .0498 .0584 .0785 .0863 .1237	0443 0854 1164 1454 1654 1741 1815 1816 1830 1987	-0557 -0296 -0099 -0095 -0211 -0346 -0454 -0552 -0642 -0738 -0927	.0152 .0098 .0076 .0066 .0067 .0070 .0076 .0089 .0110 .0135 .0180
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	- 3048 - 0968 0629 1935 2854 3454 4189 5015 5689 6386 7856 8804	.0618 .0238 .0143 .0155 .0202 .0254 .0321 .0411 .0497 .0613 .0935 .1342 .2022	0951 1348 1347 1342 1316 1251 1223 1131 1003 1003 1003	0342 0080 .0099 .0255 .0349 .0427 .0513 .0609 .0685 .0775 .0951 .1119 .1296	00 91 00 49 00 49 00 49 00 56 00 70 00 88 01 04 00 63 00 92 00 58 00 92	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4888 2948 1407 .0222 .1155 .2118 .3333 .4177 .5110 .5895 .7406 .8591	.1158 .0729 .0535 .0437 .0437 .0455 .0503 .0583 .0710 .0856 .1221 .1654	- 0397 - 0815 - 1083 - 1331 - 1464 - 1625 - 1751 - 1809 - 1795 - 1843 - 1945 - 2104	0550 0301 0111 .0072 .0174 .0286 .0422 .0518 .0616 .0713 .0887 .1031	.0134 .0085 .0135 .0058 .0057 .0069 .0078 .0094 .0117
		м	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5	.1750 .2604 .3560 .4097 .5019 .5822 .7529	.0279 .0273 .0283 .0367 .0410 .0493 .0588 .0709	1610 1388	0383 0133 .0057 .0234 .0320 .0428 .0506 .0610 .0701 .0805 .0970	*0115 *0067 *0051 *0051 *0055 *0070 *0077 *0120 *0142 *0193 *0255	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7		•1137 •0706 •0519 •0441 •0445 •0508 •0572 •0688 •0858 •1235 •1684	1660 1762 1755 1773 1916	.0263 .0376 .0495 .0582 .0680	0019 0072 0052 0048 0053 0066 0077 0088 0100

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{c}{c} = 0.04$

a, deg	c _L	CD	C _M	cı	c _n	a, deg	CL	CD	C _M	c,	c _n
		м	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1961 0087 .1096 .2076 .2711 .3157 .3806 .4239 .4844 .5306 .6546 .7584 .8276 .8333 .8045 .7757					-10 -7 -5 -3 -2 -1 0 1 2 3 5	3709 1516 .0468 .2242 .3322 .4177 .4935 .5822 .6563 .7321 .8708	.1138 .0761 .0603 .0575 .0603 .0670 .0761 .0860 .0992 .1158	- 1084 - 1425 - 1726 - 1874 - 1913 - 1876 - 1876 - 1845 - 1845 - 1838 - 1898	0396 0119 .0101 .0297 .0411 .05509 .0524 .0693 .0789 .0897 .1060	.0130 .0084 .0063 .0065 .0072 .0084 .0098 .0118 .0140 .0166 .0227
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2161 0078 .1405 .2739 .3417 .4052 .4651 .5265 .5864 .6506 .7676 .8646 .9017 .8960 .8674	.0534 .0263 .0263 .0368 .0368 .0452 .0544 .0639 .0750 .0885 .1176 .1621 .2280 .3241 .4126	0830 1053 0973 0972 0906 0900 0902 0869 0772 0651 0771 1021 1344 1369 1413	0239 .0021 .0190 .0341 .0429 .05501 .0573 .0651 .1440 .0961 .1111 .1189 .1160 .1134	*0061 *0027 *0022 *0034 *0040 *0055 *0071 *0109 *0158 *0220 *0310 *0209 *0260 *0314	-10 -7 -5 -3 -2 -1 0 1 2 3 5	4235 1995 0230 1596 2854 3744 4587 5401 6198 8469	.1188 .0800 .0630 .0592 .0596 .0653 .0743 .0856 .0985 .0970 .1554	0725 1153 1453 1735 1849 1864 1859 1859 1859 1859	0447 0175 .0026 .0228 .0360 .0461 .0562 .0652 .0743 .0857 .1015	*0129 *0086 *0068 *0062 *0067 *0075 *0090 *0103 *0126 *0151 *0103
		М	= 0.80					М	= 1.05	11-11	
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	2363 0107 .1491 .2915 .3622 .4300 .4920 .5559 .6315 .6993 .8252 .9123 1.0034	.0671 .0350 .0350 .0326 .0390 .0450 .0514 .0596 .0793 .0922 .1272 .1653 .2344	0926 1323 1323 1279 1244 1228 1126 1070 1029 0953 0900	0257 .0018 .0200 .0362 .0447 .0523 .0605 .0690 .0768 .0856 .1046 .1171 .1301	.0077 .0038 .0034 .0042 .0051 .0064 .0074 .0074 .0093 .0111 .0135 .0191 .0238	-10 -7 -5 -3 -2 -1 0 1 2 3 5	4119 2015 0385 0385 1171 2504 3467 4282 5097 5912 6579 8179	1148 0783 0638 0601 0601 0648 0739 0856 0988 1136	0693 1090 1353 1591 1763 1822 1857 1839 1851 1891	- 0 439 - 0 183 - 0 0 25 - 0 430 - 0 430 - 0 527 - 0 619 - 0 715 - 0 812 - 0 980	.0106 .0087 .0078 .0073 .0074 .0078 .0086 .0093 .0108 .0128 .0128
		М	= 0.90					М :	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5	2701 0436 .1333 .2855 .3752 .4513 .5334 .5932 .6650 .7282 .8513	.0921 .0576 .0491 .0513 .0585 .0651 .0765 .0849 .0933 .1047 .1396	1347 1665 1805 1812 1725 1801 1695 1523 1459 1484	0285 0009 .0192 .0360 .0462 .0550 .0652 .0730 .0811 .0906 .1062	.0104 .0063 .0053 .0061 .0073 .0085 .0102 .0118 .0139 .0162	-10 -7 -5 -3 -2 -1 0 1 2 3 5	- 3963 - 2024 - 0488 1091 2039 3144 4078 4867 6231 7868	.1101 .0773 .0643 .0607 .0625 .0678 .0759 .0865 .1006 .1172	0668104212901531163217401809181518531963	0433 0193 0016 .0173 .0279 .0399 .0504 .0598 .0681 .0816	.0100 .0058 .0047 .0047 .0050 .0064 .0079 .0095 .0115

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_{\mathbf{f}}}{c} = \text{NONE}$

a, deg	cr	CD	C _M	cı	Cn	a, deg	CL	C _D	C _M	cı	C _n
		м -	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5310 3947 2947 1973 1471 0969 0466 00179 07789 1327 24588 5238 5238 6925 7140 6996					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7168 5165 3900 2382 1644 0949 0148 0632 1328 2087 3373 4891 6852 9593 9804 0225	*1453 .0850 .0569 .0363 .0270 .0249 .0238 .0259 .0280 .0342 .0519 .0829 .0	.0848 .0382 .0173 .0000 -0037 -0028 .0009 .0033 .0019 -0014 -0107 -0411 -0877 -1483 -2043 -2453	0887 0631 0473 0188 0102 0007 .0085 .0171 .0256 .0416 .0604 .0863 .1218 .1262	0220 0121 007 0037 0012 0012 0015 0020 0039 0076 0156 0341 0482 0644
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25		.1219 .0598 .0329 .0218 .0144 .0126 .0144 .0162 .0218 .0329 .0510 .1034 .2197 .3143 .3996	0261 0016 -0123 -0090 0025 0041 -0097 -0130 -0130 -0148 -0171 -0196 -0359 -1152 -1527 -1634	0741 0520 0371 0227 0149 0081 0036 0066 0131 0203 0341 0505 0729 0944 0962 0938	0163 0077 0036 0019 0009 0004 0002 0002 0021 0079 0220 0351 0454	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7372 5453 4141 2626 1777 1030 0141 .0707 .1495 .2323 .3737 .5191 .7231 1.0180 1.2119	.1620 .0994 .0705 .0487 .0426 .0347 .0348 .0418 .0477 .0667 .0974 .1620 .3050 .4688 .6158	1193 0733 0496 0286 0187 0099 0053 -0036 -0103 -0214 -0402 -0697 -1220 -1934 -2350 -2931	0866 0631 0467 0301 0203 0114 0016 0082 0180 0265 0435 0611 0856 1245 1497	0229 0137 0097 0061 0042 0023 0024 0030 0035 0055 0090 0168 0359 0359
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6504 5053 3627 2201 1551 0926 0150 .0575 .1201 .1926 .3252 .4778 .6429 .7505 .7830 .8055	*1156 *0640 *0345 *0185 *0160 *0148 *0135 *0160 *0173 *0223 *0345 *0615 *1143 *2251 *2200 *4158	.0160 -0061 -0144 -0127 -0088 -0055 -0000 -0066 -0022 -0066 -0044 -0265 -1113 -1555 -1704	0795 0593 0417 0245 0168 0099 0052 .0233 .0395 .0577 .0789 .0963 .0963 .0988 .1012	0171 0096 0066 0021 0014 0009 0006 0010 0010 00257 0387 0514	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7197 5374 4016 2503 1707 0970 0136 0640 1416 2231 3589 6887 1-0243 1-2649 1-3308	1573 0964 0677 0477 0429 0382 0372 0382 0429 0497 1001 1573 3053 4980 6679	*1189 *0760 *0545 *0322 *0223 *0129 *0047 *-0034 *-0129 *-0721 *-1184 *-2217 *-2686 *-3004	0851 0618 0618 0289 0195 0072 .0072 .0157 .0248 .0408 .0587 .0807 .1218 .1532 .1664	0228 0142 0101 0056 0045 0026 0026 0029 0037 0056 0091 0061 0360 0360
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	. 3435 . 4876 . 6649 . 8865 . 8754	.1330 .0740 .0437 .0239 .0197 .0175 .0164 .0197 .0262 .0414 .0709 .1308 .2529 .3542 .4665	.0500 .0172 .0010 0064 0064 0039 0015 0035 .0035 0029 0225 0554 1010	-0628 -0461 -0287 -0038 -00113 -0018 -0170 -0256 -0414 -0595 -0843 -1140	0202 0109 0066 0031 0021 0014 0009 0008 0009 0012 0062 0062 00302 0302 0215	-10 -77 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7087 5259 3916 2424 1623 0877 0093 .0746 .1492 .2294 .3637 .5073 .6900 .9996 1.2421 1.3801	*1537 *0949 *0651 *0459 *0350 *0352 *0343 *0358 *0358 *0459 *0651 *0953 *1537 *2980 *4897 *6953	1172 0750 0545 0322 0215 0136 0046 -0054 -00148 -0231 -0454 -0672 -1147 -2005 -2624 -3160	.1479	0235 0147 0097 0062 0050 0028 0029 0033 0038 0069 0169 0356 0870

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = 0.20$

a, deg	C ^T	CD	C _M	cı	C _n	a, deg	CL	CD	C _M	cı	C _n
		М	= 0.40					N	1 = 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	24150972 .0252 .1512 .1908 .2520 .3060 .3660 .4104 .4680 .5508 .6696 .8208 .9071 .8783					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 2 2 2 2 5 2 5 7 2 5 7 1 2 5 7 1 2 7 1 2 7 1 7 1 2 7 1 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 1 2 7 2 7	5179361521140317 -0740 -1797 -2790 -3699 -4545 -5390 -6743 -8223 -9978 -2134 -0908 -0781	1279 0801 0552 0395 0395 0446 0552 0634 0738 0520 1518 2266 3670 4501	0211 0444 0748 1099 1239 1426 1519 1637 1637 1730 1824 2105 22450 2665 2684	0634 0412 0224 0019 0101 0226 0334 0534 0640 0636 0947 1201 1285 1279 1259	014800820037000800030010002000320046024304550518
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2777 1055 .0167 .1444 .2037 .2610 .3240 .4036 .4036 .5091 .6258 .7461 .8757 .9201 .8961	.0800 .0337 .0237 .0211 .0255 .0300 .0344 .0437 .0481 .0674 .1011 .1692 .2822 .3744 .4562	0983 1229 1246 1253 1246 1229 1212 1212 1116 1130 1351 1965 2137	0324 0093 .0042 .0186 .0252 .0312 .0387 .0473 .0545 .0602 .0740 .0896 .1073 .1153 .1105	-0036 0010 0024 0032 0035 0030 0023 0027 0017 0014 -0007 -0046 -0123 -0389 -0492	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5509 3605 2086 0608 .00223 .1154 .2309 .3220 .4253 .5124 .6622 .8162 .9924 1,2637 1,3974	.1385 .0907 .0676 .0557 .0529 .0518 .0557 .0628 .0717 .0857 .1146 .1584 .2351 .2939 .2839	.0067 -0381 -0694 -0919 -1066 -1223 -1388 -1532 -1702 -1859 -2074 -2311 -25598 -3046 -3180 -3566		0160 0087 0053 0031 0024 0021 0022 0039 0055 0091 0148 0243 0243 0813
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3361 1768 0439 1041 1819 2546 3198 4803 5456 6823 8027 9256 9230 9406 9356	.0758 .0381 .0233 .0216 .0173 .0266 .0314 .0389 .0469 .0554 .0790 .1179 .1776 .2824 .4811		0398 0187 00300 0134 0221 0302 0386 0481 0578 0656 0808 0808 0808 1136 1132 1132	0068 0017 -0009 -0015 -0015 -0016 -0005 0002 0012 0043 0087 0168 0310 0476 0552	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5464 3578 2178 0603 .0117 .1050 .2003 .2820 .3733 .4628 .6320 .7778 .9606 1.2328 1.4273 1.4195	.1377 .0908 .0698 .0554 .0535 .0535 .0554 .0622 .0698 .0813 .118 .1540 .2295 .3903 .7364	•0121 •0323 •0624 •0838 •0968 •1110 •1239 •1368 •1514 •1669 •1987 •2237 •2564 •3071 •3484 •3613	-0719 -0497 -0332 -0154 -0071 -0032 -0135 -0230 -0332 -0431 -0628 -0806 -1019 -1337 -1598 -1586	0162 0091 0057 0029 0026 0023 0032 0032 0042 0057 0246 0149 0245 0445 0678 0689
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4663 2920 1144 .0477 .1443 .2243 .2976 .3775 .4563 .5529 .6884 .8061 .9438 1.1414 1.0437	.0535 .0644 .0917 .1310 .1972 .3309	0565 0835 1228 1375 1425 1449 1483 1596 1695 1695 2137 2555 2604	0559 0325 0106 .0077 .0190 .0279 .0455 .0455 .0672 .0825 .0985 .1182 .1416 .1232	0120 0049 0008 .0009 .0005 .0001 0005 0016 0034 0065 0116 0208 0396 0491	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5311 3459 2113 0636 0224 1028 1870 2767 3590 4469 5946 7517 9256 1-1967 1-3837 1-4885	.1361 .0883 .0671 .0542 .0524 .0524 .0598 .0681 .0791 .1075 .1481 .2216 .3779 .5720	.0116 0310 0571 0815 0951 1138 1195 1320 1460 1605 1882 2151 2482 2978 3830	0737 0523 0365 0198 0103 0015 .0079 .0180 .0274 .0364 .0543 .0728 .0728 .0941 .1253 .1492 .1646	0167 0104 0076 0044 0032 0033 0040 0062 0096 0149 0241 0431 0664 0936

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3MODEL - Continued $\frac{t}{c} = \text{ 0.06} \qquad \frac{^cf}{c} = \text{ 0.30}$

a, deg	C ^T	CD	C _M	cı	Cn	a, deg	C _L	C _D	C _M	cı	$c_{\rm n}$
		М =	0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1905 0395 .0898 .1977 .2444 .3055 .3738 .4169 .4852 .5391 .6325 .7475 .8769 .9128 .8697 .8194					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4415 2884 1447 .0866 .1996 .2873 .3876 .4774 .5598 .6232 .7647 .8978 1.0605 1.2126 1.1492	*1185 *0744 *0534 *0456 *0484 *0613 *0847 *0744 *0847 *0925 *1314 *1756 *3927 *5017 *6088	0739 0911 11914 1542 1705 1916 1869 1986 1983 2173 2173 2477 2477 2757	0537 0313 0115 .0125 .0253 .0355 .0467 .0667 .0747 .0923 .1094 .1299 .1378 .1309	0160 0095 0056 0034 0050 0052 0071 0084 0092 0139 0139 0197 0304 0304
		М =	0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2312 0518 .0869 .2201 .2885 .4426 .4235 .4846 .5308 .5863 .7010 .8249 .9248 .9507 .9137 .8767	.0629 .0237 .0163 .0181 .0211 .0255 .0329 .0392 .0462 .0555 .0773 .1165 .1838 .2985 .3928 .4783	0966 1228 1228 1219 1235 1210 1228 1128 1187 1129 1105 1088 1309 1801 1972 2005	-0287 -0045 -0014 -0269 -0344 -0419 -0494 -0569 -0625 -0688 -0829 -0988 -1134 -1179 -1101	0082 0023 0014 0016 0017 0023 0026 0032 0044 0069 0116 0204 0360 0483 0585	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5058 2934 1315 .0445 .1558 .2610 .3682 .4593 .5442 .6252 .7627 .9145 .0804 1.3151 1.4243 1.3313	.1333 .0886 .0686 .0587 .0587 .0702 .0836 .0945 .1408 .1890 .2717 .4338 .6070 .7283	-0403 -0805 -1119 -1410 -1589 -1767 -1924 -2050 -2126 -2282 -2372 -2506 -2730 -3043 -3150 -3357	-0575 -0319 -0124 -0074 -0188 -0316 -0434 -0540 -0635 -0732 -0990 -1287 -1568 -1748 -1617	0167 0100 0062 0044 0044 007 0084 0102 0104 01020 0104 0209 0524 0752
		М =	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2795 - 0940 0514 1968 12657 3346 4850 5577 8723 9876 9400 9575 9350	.0672 .0308 .0223 .0233 .0266 .1547 .0634 .0481 .0574 .0667 .0942 .1374 .2010 .3083 .4141 .5141	-1247 -1442 -1442 -1414 -1414 -1425 -1414 -1319 -1286 -1375 -1957 -2135 -2190	0325 0091 .0077 .0243 .0325 .0404 .0489 .0578 .0665 .0740 .0898 .1067 .1233 .1160	0084 0035 0017 0019 0025 0036 0046 0055 0064 0099 0152 0377 0513 0643	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	5013 3031 150 1036 1108 1982 2934 3984 4761 5674 7209 8589 1-0377 1-2709 1-2709 1-3874	1257 0812 0641 0550 0554 0583 0645 0731 0841 0985 1329 1792 2590 4234 66117 7608	0215 0623 0894 1182 1324 1461 1612 1762 2218 2218 2239 2239 2622 33525	0549 0303 0135 .0052 .0159 .0258 .0362 .0465 .0571 .0674 .0858 .1022 .1226 .1755 .1736	016 010 006 004 005 007 008 010 014 020 023 079 099
		м	= 0.90					M	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	.2908 .3718 .4540 .5375 .6285 .7595 .8705 .9967	.0961 .0562 .0371 .0333 .0360 .0415 .0480 .0590 .0682 .0830 .1134 .1534 .2200 .3472 .4564 .5634	-0933 -11203 -1448 -1547 -1547 -1562 -1596 -1611 -1669 -1719 -1792 -2087 -2430	-0453 -0225 -0031 -0171 -0271 -0356 -0447 -0544 -0643 -0751 -1074 -1257 -1365 -1246 -1218	0139 0063 0024 0028 0037 0048 0061 0078 0116 0170 0264 0427 0556	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4823 3010 1552 .0150 .1028 .1851 .2710 .3720 .4486 .5328 .6767 .8262 .9982 1.2225 1.4020 1.4880	.1279 .0819 .0624 .0538 .0542 .0565 .0611 .0703 .0809 .0948 .1279 .1738 .2537 .4137 .6086 .8128	2299 2547 2936 3324	.0145 .0225 .0337 .0439 .0535 .0634 .0805 .0974 .1177 .1455	031 051 078

TABLE 3.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 3 MODEL - Concluded $\frac{t}{c} = 0.06 \qquad \qquad \frac{c_f}{c} = 0.40$

a, deg	CT	$^{\rm C}{}_{\rm D}$	G _M	cı	C _n	a, deg	C ^L	CD	C _M	cı	C _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	1438 .0108 .1258 .2372 .3127 .3522 .4133 .4528 .5103 .5571 .6613 .7799 .8913 .8985 .8733 .8158					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3745 1899 0179 .1941 .2848 .3692 .4557 .5338 .6118 .6899 .7954 .9135 .00549 1.0127 1.1181 1.0759	.1162 .0757 .0643 .0622 .0726 .0829 .0954 .1089 .1245 .1525 .1970 .2749 .4150 .5084 .6184	0723 1073 1446 1773 1890 1997 1960 1983 2030 2170 2333 2567 2754	0408 0179 .0026 .0261 .0364 .0461 .0563 .0649 .0743 .0836 .0980 .1127 .1314 .1536 .1348	0144 0088 0062 0067 0074 0124 0183 0237 0680 0538 0640
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 1755 0095 1478 2772 3381 4046 4601 5229 5691 6356 7484 8595 9608 9275 975 8795	.0591 .0255 .0255 .0259 .0344 .0410 .0473 .0547 .0654 .0765 .1016 .1438 .2162 .3215 .5033	0678 0981 1021 1047 1021 1021 1021 0998 0981 0956 0981 1348 1348 2165	0209 .0030 .0182 .0335 .0404 .0478 .0550 .0613 .0756 .0894 .1034 .1154 .1136 .1085 .1043	0062 0029 0019 0020 0024 0032 0036 0047 0057 0139 0232 0380 05500 0602	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 2 2 2	4142 2101 050 1364 2526 3485 3485 5859 6668 8082 9193 1- 0911 1- 2850 1- 3861 1- 2810	.1263 .0885 .0249 .0695 .0715 .0786 .0875 .0987 .1123 .1291 .1669 .2136 .3011 .4570 .6259 .7454		0451 0203 0013 .0191 .0322 .0433 .0515 .0613 .0793 .0968 .1128 .1318 .1576 .1700	0161 0101 0072 0068 0073 0089 0103 0117 0141 0188 0249 0360 0572 0790
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2191 - 0275 - 1152 - 2504 - 3180 - 3881 - 4520 - 5221 - 5659 - 6511 - 7738 - 8739 - 9991 - 9115 - 9365 - 9090	0646 0363 0326 0326 0431 0506 05586 0676 0739 0861 11570 2216 3203 4285	- 0 0 8 6 - 1 2 9 6 - 1 3 1 8 - 1 3 2 9 - 1 3 2 9 - 1 3 4 0 - 1 3 1 8 - 1 3 0 2 - 1 2 3 0 - 1 1 6 3 - 1 2 3 0 - 1 3 0 2 - 1 9 6 1 - 2 2 8 2	-0237 -0010 -0152 -0312 -0391 -0472 -0547 -0636 -0689 -0778 -0934 -1094 -1256 -1114 -1135 -1102		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4075 2135 01406 2135 3066 3881 4716 5492 6307 7821 8927 1. 0596 1. 2730 1. 4089 1. 3972	.1250 .0887 .0745 .0697 .0716 .0782 .0860 .0974 .1098 .1259 .1622 .2119 .2940 .4628 .6453 .7922		0444 0212 0039 .0157 .0272 .0377 .0471 .0565 .0659 .0751 .0911 .1071 .1266 .1532 .1727 .1715	0156 0099 0083 0071 0075 0085 0102 0117 0138 0180 0243 0346 0564 0564 0563
		М :	= 0.90					M =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	32161297 .0255 .1940 .2783 .3471 .4158 .5045 .5877 .6697 .7829 .8982 .0201 .0335 .0423	.0976 .0599 .0490 .0479 .0534 .0599 .0654 .1353 .0883 .1020 .1326 .1772 .2482 .3524 .4744	0907 1227 1433 1497 1530 1545 1520 1619 1545 1619 1741 1741 2208 2551 2620	0354 0120 .0063 .0251 .0350 .0431 .0513 .0619 .0709 .0816 .0969 .1127 .1292 .1256 .1249 .1220	0123 0068 0048 0047 0053 0060 0069 0083 0113 0151 0214 0310 0438 0585 0715	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3974 2183 0653 .1063 .1959 .2798 .3638 .4608 .5410 .6156 .7369 .8731 1.0335 1.2499 1.3805	.1211 .0871 .0716 .0670 .0688 .0670 .0826 .0918 .1056 .1201 .1541 .2047 .2845 .4405 .6423 .8348	0425 0866 1205 1465 1630 1733 1836 1939 2022 2063 2228 2419 2657 3054 3879	0433 0219 0041 .0148 .0249 .0340 .0438 .0543 .0635 .0720 .0872 .1035 .1217 .1464 .1672	0163 0112 003 0074 0076 0083 0091 0103 0122 0139 0181 0242 0347 0548 0836 1082

Table 4.- The aerodynamic characteristics of the aspect ratio 4-model $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = \text{NONE}$

a, deg	CT	CD	C _M	cı	C _n	a, deg	CL	CD	C _M	cı	c _n	
		М =	= 0.40					М	= 0.95			
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6610 5073 3667 2438 1801 1186 0395 .0285 .0878 .1537 .2833 .4282 .5907 .6830 .6896 .6852					-7 -5 -3 -2 -1 0 1 2 3 5 7	7197 5466 3685 2597 1599 0346 2003 2943 5095 6826	*1094 *0623 *0325 *0192 *0137 *0116 *0106 *0152 *0228 *0480 *0845	.0930 .0606 .0326 .0189 .0122 .0104 .0074 .0011 0088	0803 0615 0413 0291 0169 0038 .0105 .0229 .0347 .0591 .0782	*0115 *0068 *0035 *0020 *0013 *0011 *0015 *0024 *0041 *0085 *0142	
		М :	= 0.60					М	= 1.00			
-10 -7 -5 3 -2 -1 0 1 2 3 5 7 10 15 20 25	7326 5826 4152 2717 1935 1174 0217 .0543 .1283 .2043 .2043 .5130 .6761 .7370 .7370	.1257 .0615 .0293 .0145 .0107 .0086 .0064 .0080 .0117 .0171 .0348 .0647 .1283 .2191 .3015 .3902	0284 -0158 -0154 -0053 -0027 -0021 -0024 -0057 -0129 -0179 -0307 -0179 -0158 -0158 -0677 -0757 -0819	0844 0660 0462 0297 0204 0115 0010 .0089 .0181 .0270 .0452 .0643 .0864 .1006 .1016	*0156 *0083 *0040 *0021 *0016 *0010 *0008 *0012 *0018 *0028 *0059 *0109 *0205 *0333 *0442 *0545	-7 -5 -3 -2 -1 0 1 2 3 5 7	6049 4112 2836 1985 1111 0095 992 2056 2883 4348 5931	.0915 .0552 .0343 .0265 .0215 .0195 .0180 .0244 .0297 .0503 .0805	• 0729 • 0360 • 0173 • 0116 • 0037 • 0009 • 0003 • 0114 • 0195 • 0342 • 0624	0642 0479 0315 0219 0118 0004 .0115 .0233 .0341 .0505 .0674	.0097 .0057 .0034 .0025 .0020 .0020 .0021 .0034 .0047 .0079 .0120	
		М	= 0.80			M = 1.05						
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	- 8224 - 6585 - 4966 - 3248 - 2264 - 1281 - 0387 - 1669 - 2562 - 4559 - 6227 - 7419 - 7866 - 8164	.1436 .0799 .0399 .0194 .0139 .0092 .0066 .0073 .0150 .0337 .0648 .1253 .2242 .3165	.0233 -0072 -0139 -0072 -0010 -0001 .0076 .0109 .0244 .0300 .0206 -0192 -0768 -0957	0927 0730 0731 0332 0222 0113 0014 0109 0215 0323 0531 0728 0904 0999 1013	*0166 *0092 *0050 *0025 *0017 *0001 *0001 *0019 *0029 *0065 *0113 *0220 *0335 *0436	-7 -5 -3 -2 -1 0 1 2 3 5 7	5612 4226 2817 1954 1045 0068 1908 2817 2817 5680	.0888 .0564 .0352 .0277 .0226 .0204 .0210 .0252 .0321 .0511	.0681 .0411 .0253 .0176 .0080 .0001 0058 .0124 0230 0399 0607	0615 0464 0300 0217 0097 .0014 .0138 .0234 .0508 .0564	.00 88 .00 55 .00 31 .00 22 .00 17 .00 13 .00 24 .00 29 .00 43 .00 73 .01 15	
M = 0.90						M = 1.10						
-7 -5 -3 -2 -1 0 1 2 3 5 7	7107 5404 3619 2518 1521 0420 .0787 1862 .3121 .5245 .6871	.0993 .0529 .0239 .0142 .0097 .0064 .0097 .0148 .0413 .0767	.0416 .0143 0018 0059 .0018 .0087 .0148 .0205 .0144 0126 0404	0806 0607 0394 0265 0159 0040 .0097 .0213 .0352 .0607 .0806	.0114 .0059 .0028 .0017 .0010 .0008 .0011 .0019 .0038 .0089 .0143	-7 -5 -3 -2 -1 0 1 2 3 5 7	5597 4242 2842 1946 1115 0131 .0853 .1749 .2602 .4067 .5357	0887 0556 0352 0285 0237 0207 0223 0274 0342 0546 0828	.0690 .0449 .0276 .0192 .0092 .0003 0078 0128 0236 0414	0597 0451 0290 0196 0096 .0005 .0124 .0323 .0498 .0647	.0086 .0052 .0028 .0020 .0015 .0014 .0019 .0026 .0037 .0070	

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_F}{c} = 0.10$

a,	CL	. CD	C _M	cı	C _n	a, deg	c _r	C _D	C _M	cı	c _n			
		М =	= 0.40			M = 0.95								
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3849 2357 0930 .0035 .0695 .1179 .1881 .2314 .2920 .3503 .4747 .6012 .7764 .8088 .7875 .7526					-10 -7 -5 -3 -2 -1 0 1 2 3	7523 5745 3798 1972 0755 .0463 .1753 .2946 .4114 .5283	.1640 .0994 .0610 .0365 .0299 .0293 .0335 .0383 .0467	.0159 .0028 0334 0728 0885 1091 1206 1331 1395	0873 0632 0416 0185 0043 .0006 .0332 .0369 0236 .0628	**O178 **O112 **O067 **O042 **O034 **O042 **O055 **O073 **O096			
		м :	= 0.60					м	= 1.00					
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4740 2953 1327 0064 0696 1434 22161 2878 3767 4430 5821 7041 8068 8325 8218	.0826 .0411 .0231 .0216 .0221 .0274 .0353 .0426 .0532 .0853 .1142 .1784 .1400 .1858 .2231	0525 0994 0890 0863 0894 0795 0789 0792 0651 0563 0951 1196 1184	0567 0325 0130 .0026 .0120 .02203 .0289 .0381 .0471 .0552 .0726 .0906 .1058 .1133 .1120	**************************************	-10 -7 -5 -3 -2 -1 0 1 2	7444 5264 3734 2110 1113 0139 .0974 .2226 .3293 .4569	.1619 .0969 .0650 .0450 .0394 .0365 .0376 .0410 .0468	.0460 .0054 0230 0474 0598 0714 0865 1033 1192	0850 0581 0396 0206 0088 .0026 .0144 .0294 .0413 .0545	*0178 *0106 *0075 *0054 *0045 *0045 *0045 *0066 *0066			
		М :	= 0.80			M = 1.05								
-10 -7 -5 -3 -2 -1 0 1 2 3 5	5954 4048 2305 0660 .0352 .1305 .2258 .3461 .4356 .5309 .7025	.1096 .0570 .0307 .0205 .0205 .0224 .0267 .0310 .0375 .0465	0757 0982 0983 0943 0921 0925 0865 0939 0880 0820 0727	0712 0456 0165 0045 .0073 .0182 .0296 .0438 .0534 .0641 .0845	.0131 .0067 .0040 .0027 .0025 .0029 .0036 .0046 .0060 .0079 .0128	-7 -5 -3 -2 -1 0 1 2 3 5	5034 3561 2161 1181 0245 0757 1827 2762 5769	.0953 .0652 .0487 .0422 .0405 .0417 .0433 .0498 .0597 .0893	.0065 0214 0422 0514 0614 0756 0840 1002 1153 1480	0558 0385 0211 0101 .0005 .0127 .0245 .0355 .0476 .0693	*0090 *0055 *0035 *0025 *0023 *0031 *0045 *0065			
	M = 0.90						M = 1.10							
-10 -7 -5 -3 -2 -1 0 1 2	7771 5318 4286 1239 -0026 .1110 .2349 .3434 .4647 .5783	.1466 .0822 .0441 .0267 .0225 .0241 .0283 .0321 .0403 .0523	0107 0454 0579 1023 1102 11123 1123 1129 1172	0842 0574 0317 0108 .0033 .0163 .0294 .0423 .0558 .0683	.0172 .0093 .0049 .0031 .0028 .0030 .0038 .0049 .0068	-7 -5 -3 -2 -1 0 1 2 3 5	4845 3451 2101 1158 0236 .0579 .1543 .2487 .3516 .5230	.0891 .0617 .0448 .0401 .0379 .0432 .0437 .0511 .0611	.0079 0177 0370 0442 0562 0631 0755 0904 1046	.0330 .0442	.0078 .0048 .0030 .0027 .0021 .0024 .0033 .0044 .0058			

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Continued $\frac{t}{c} = 0.04 \qquad \qquad \frac{c_f}{c} = 0.20$

C ^T	, C _D	C _M	cı	C _n	a, deg	cT	C _D	C _M	cı	. c _n			
	м =	0.40			м = 0.95								
32881270 .0109 .1302 .1954 .2529 .3169 .3722 .4287 .4938 .6186 .7271 .8139 .8356 .7987 .6728					-10 -7 -5 -3 -2 -1 0 1 2	6673 4277 2273 0367 .1027 .3422 .4522 .5522 .6599	•1482 •0835 •0505 •0354 •0324 •037 •0571 •0460 •0559 •0688	0273 0657 1031 1377 1625 1736 1754 1740 1768 1846	0769 0866 0247 0019 .0134 .0271 .0399 .0519 .0630 .0732	.0169 .0094 .0056 .0040 .0042 .0051 .0064 .0080 .0102			
	м -	= 0.60					М	= 1.00					
3898 1611 .0021 .1536 .2395 .3136 .3823 .4511 .5262 .6014 .7346 .8420 .8914 .8634 .8656 .8570	0769 0280 0125 0137 0169 0193 0241 0299 0369 0467 0747 1125 1759 1363 1785	0747 1154 1148 1141 1068 1068 1033 0944 0872 0818 0675 0727 1100 1223 1194 1153	0448 0163 0034 0207 0301 0383 0468 0541 0624 0709 0886 1039 1140 1147 1082 1066	*0086 *0028 *0014 *0016 *0024 *00032 *0041 *0053 *0068 *0087 *0135 *0195 *0285 *0417 *0514 *0617	-10 -7 -5 -3 -2 -1 0 1 2 3	6566 4354 2678 0931 0116 1281 2678 3958 5053 5984	.1477 .0876 .0576 .0530 .0430 .0384 .0367 .0389 .0446 .0550	0032 0438 0756 1069 1268 1457 1674 1738 1769 1812	0744 0495 0288 0080 .0044 .0177 .0327 .0463 .0579 .0680	.0163 .0099 .0068 .0050 .0047 .0049 .0058 .0073 .0092			
	М	= 0.80			M = 1.05								
3974 2178 0324 .1281 .3165 .4062 .4931 .5785 .6727 .8596	.0874 .0394 .0197 .0169 .0177 .0206 .0249 .0313 .0376 .0481	0868 1360 1421 1368 1361 1352 1292 1205 1094 1006	0486 0249 0034 .0153 .0262 .0355 .0456 .0547 .0652 .0759 .0965	.0098 .0041 .0023 .0023 .0031 .0040 .0051 .0065 .0083 .0106	-10 -7 -5 -3 -2 -1 0 1 2 3	6307 4249 2484 1118 0067 .0917 .2125 .3511 .4652 .5591	.1408 .0841 .0594 .0440 .04401 .0390 .04401 .0440 .0539 .0660	0044 0404 0679 0921 1092 1229 1446 1640 1717	-0712 -0475 -0288 -0105 -0131 -0266 -0424 -0538 -0641	*U154 *0091 *0062 *0047 *0045 *0055 *0067 *0085 *0105			
	м	= 0.90					м	= 1.10					
1684 .0324 .1581 .2695 .3692 .4677 .5830	.0854 .0656 .0376 .0249 .0236 .0264 .0306 .0376 .0472 .0605	0814 1084 1278 1461 1525 1554 1482 1479 1482 1525	0678 0403 0177 .0059 .0187 .0309 .0423 .0535 .0668 .0786	.0137 .0070 .0040 .0031 .0034 .0044 .0057 .0073 .0097	-10 -7 -5 -3 -2 -1 0 1 2		•1371 •0836 •0588 •0439 •0386 •0402 •0429 •0466 •0545 •0667	1003 1687 1280 1464 1553	.0000 .0111 .0225 .0359 .0473	.0143 .0086 .0060 .0045 .0045 .0052 .0064 .0082			
	328812700109130219542529316937224287493816110021153679876728 389816110021153638931611002115363893161100211536389316110021397421783878 -	32881270 .0109 .1302 .1954 .2529 .3169 .3722 .4287 .4938 .6186 .7271 .8139 .8356 .7987 .6728 M. 3898 .0769 -1611 .0280 .0012 .0125 .1536 .0137 .2395 .0169 .3136 .0137 .2395 .0169 .3136 .0137 .2395 .0169 .3136 .0177 .346 .0747 .8420 .1125 .8634 .1759 .8634 .1759 .8634 .1759 .8634 .1759 .8634 .1363 .8656 .1785 .8570 .2208 M 3974 .2178 .0394 .0319 .2311 .0177 .3165 .0206 .4062 .2311 .0177 .3165 .0206 .4062 .2311 .0177 .3165 .0206 .4062 .2311 .0177 .3165 .0206 .4062 .2494 .4931 .0313 .5785 .0376 .6727 .0461 .8596 .0798	M = 0.40 3288 -1270 -0109 -1302 -1954 -2529 -3169 -3722 -4938 -6186 -7271 -8139 -8356 -7987 -6728 M = 0.60 3898 -0769 -0747 -0818 -0280 -1154 -0021 -0125 -1148 -0021 -0125 -1148 -0127 -1141 -2395 -0169 -1108 -3823 -0241 -1033 -4511 -0299 -0944 -5262 -0369 -0872 -0114 -0467 -0818 -7346 -0747 -0675 -08420 -1159 -0727 -0818 -7346 -0747 -0675 -08420 -1159 -0727 -0818 -7346 -0747 -0675 -08420 -1159 -1100 -08634 -1363 -1194 -0868 -1870 -2208 -1153 M = 0.80 3974 -0178 -0374 -0178 -0374 -0178 -0374 -0178 -0374 -0376 -1194 -0376 -1194 -0376 -1194 -0376 -1194 -0376 -1194 -1106 -11	M = 0.40 328812700109130219542529316937224938161102801154016302112511480034153601371141020703160316031710680316 -	M = 0.40 32881270 -0109 -1302 -1954 -2529 -3169 -3722 -4287 -4938 -6186 -7271 -8139 -8356 -7987 -6728 M = 0.60 M = 0.60 M = 0.60 3898 -076907470448 -0086 -7271 -0108 -0208 -1154 -0163 -0028 -0021 -0125 -1148 -0034 -0014 -0020 -1108 -0301 -0024 -0116 -0108 -0021 -0108 -0108 -0021 -0108 -0021 -0108 -0021 -0108 -0024 -0108 -0028 -0119 -0108 -0140 -0285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -0141 -00285 -00249 -0141 -0034 -0024 -0031 -0034 -0031 -0034 -0035 -0036 -0036 -0036 -0037 -0048 -0039 -0044 -0057 -0058 -0079 -0044 -0057 -0058 -0079 -0044 -0057 -0058 -0079 -0068 -0079 -0044 -0068 -0079 -0044 -0068 -0079 -0044 -0068 -0079 -0044 -0068 -0079 -0044 -0068 -0079 -0068 -0068 -0079 -0068 -0079 -0068 -0068 -0079 -0068 -0068 -0079 -0068 -0068 -0079 -0068 -0068 -0079 -0068 -0068 -0079 -0068	M = 0.40 32881270 -0109 -1302 -1954 -2529 -3169 -3722 -4287 -4938 -1616 -7271 -8139 -8356 -7987 -61728 M = 0.60 3888 -16161 -0280 -1154 -0163 -0280 -1154 -0163 -0280 -1154 -0163 -0280 -1556 -0021 -0137 -1141 -0207 -016 -3383 -0021 -1368 -0021 -0021 -0137 -1141 -0207 -016 -3383 -0021 -1025 -1025 -1025 -1025 -1028 -1027 -1027 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1028 -1038 -1048	M = 0.40 M = 0.40 M = 0.40	**************************************	*** **********************************	*** **********************************			

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4-MODEL - Continued $\frac{t}{c} = 0.04 \qquad \frac{c_f}{c} = 0.30$

a, deg	CT	C _D	C _M	cı	Cn	a, deg	C _L	CD	C _M	cı	C _n	
		м	- 0.40					М	= 0.95			
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2995 0803 .0499 .1693 .2344 .2952 .3646 .4232 .4797 .5426 .6685 .7640 .8378 .7944 .7683					-7 -5 -3 -2 -1 0 1 2	3324 1247 07733 2114 3178 4253 5231 6355	.0423 .0290 .0233 .0236 .0255 .0293 .0332	.0597 .0097 -0381 -0701 -0941 -1177 -1386 -1637	0346 0097 .0134 .0278 .0392 .0519 .0630 .0736	*0100 *0068 *0058 *0061 *0071 *0084 *0104 *0107	
		м -	• 0.60					м	= 1.00			
-10 -7. -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3351 1010 .0677 .2073 .3007 .3737 .4489 .5133 .5928 .6551 .7883 .8871 .9128 .8871 .8720 .8828	.0708 .0293 .0190 .0224 .0259 .0317 .0383 .0449 .0639 .0948 .1321 .2018 .2936 .3834 .4711	0700 1178 1168 1117 1111 1051 1047 0951 0967 09845 1207 1207 1441 1456	0379 0089 .0108 .0273 .0370 .0456 .0546 .0622 .0701 .0782 .0961 .1095 .1173 .1180 .1140	.0085 .0032 .0022 .0026 .0032 .0040 .0050 .0063 .0080 .0099 .0148 .0202 .0451 .0539 .0621	-7 -5 -3 -2 -1 0 1 2	3459 1735 0047 .1165 .2492 .3913 .4868 .5893	.0873 .0636 .0524 .0501 .0510 .0558 .0653 .0773	0828 1164 1463 1672 1877 1912 1947 1962	0376 0159 .0041 .0182 .0323 .0477 .0580 .0684	.0101 .0075 .0063 .0062 .0086 .0080 .0091	
		м -	0.80			M = 1.05						
-10 -7 -5 -3 -2 -1 0 1 2 3 5	3378 1317 .0611 .2156 .3076 .3915 .4607 .5446 .6285 .7448 .9067	.0807 .0369 .0232 .0246 .0283 .0315 .0380 .0453 .0550 .0687 .1032	0843 1433 1423 1397 1364 1050 1152 1148 1185	0391 0123 .0095 .0156 .0374 .0463 .0550 .0650 .0748 .0860 .1061	.0097 .0041 .0028 .0035 .0043 .0052 .0066 .0083 .0100 .0130	-7 -5 -3 -2 -1 0 1 2 3	3377 1789 0268 .0816 .1990 .3388 .4450 .5323 .6284	.0841 .0632 .0522 .0517 .0522 .0564 .0652 .0756 .1045	0787 1086 1330 1497 1695 1867 1893 1694	0366 0174 .0013 .0133 .0267 .0416 .0543 .0551 .0729	.0090 .0065 .0059 .0057 .0059 .0067 .0079	
		М =	0.90					М =	: 1.10			
-7 -5 -3 -2 -1 0 1 2 3	23590415 .1594 .2761 .3797 .4705 .5651 .6714 .7465	.0663 .0446 .0389 .0427 .0462 .0542 .0631 .0711	1473 1693 1826 1847 1843 1835 1809 1719 1731	0246 0010 -0226 -0344 -0462 -0570 -0678 -0777 -0865	.0076 .0051 .0049 .0057 .0069 .0084 .0104 .0122	-7 -5 -3 -2 -1 0 1 2	3337 1873 0312 .0624 .1593 .2799 .4015 .4930 .5877	.0807 .0614 .0519 .0511 .0524 .0569 .0640 .0741	-0725 -0997 -01237 -01384 -01527 -01712 -01840 -01863 -01944	0363 0188 0004 .0110 .0216 .0351 .0498 .0596	.0081 .0058 .0049 .0049 .0055 .0063 .0074 .0090	

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Continued $\frac{t}{c} = \text{0.04} \qquad \qquad \frac{c_f}{c} = \text{0.40}$

C	D		C _M	cı	C _n	a, deg	CL	CD	C _M	cı	Cn	
	М =	-	0.40					М	= 0.95			
						-10 -7 -5 -3 -2 -1 0 1 2	4715 2544 0310 .1799 .3102 .4343 .5211 .6179 .7320	.1297 .0854 .0635 .0565 .0579 .0641 .0735 .0839 .0976	0965 1422 1748 2027 2060 2064 2010 2049	0521 0243 .0011 .0250 .0392 .0520 .0623 .0727 .0823	.0155 .0099 .0073 .0068 .0075 .0088 .0104 .0123 .0147	
	М =	1 =	0.60					М	= 1.00			
	0577 0223 0201 0201 0204 0357 0443 0524 0625 0759 1094 1556 2227 3187 44078		0727 1128 1079 1072 0987 0963 0913 0819 0756 0683 0814 1228 1402 1414 1449	0301 .0005 .0204 .0373 .0473 .0543 .0627 .0708 .0798 .0887 .1053 .1155 .1155 .1142 .1139	.0075 .0026 .0024 .0034 .0052 .0065 .0082 .0101 .0125 .0180 .0245 .0333 .0452 .0547 .0658	-10 -7 -5 -3 -2 -1 0 1 2	4880 2706 0969 .0945 .2481 .3722 .4667 .5636 .6617	.1307 .0868 .0677 .0601 .0590 .0639 .0727 .0828	-:0669 -:1152 -:1463 -:1763 -:1954 -:2005 -:2003 -:1994 -:2020	0545 0276 0061 .0 163 .0 330 .0 462 .0 572 .0 679 .0 769	.0145 .0098 .0076 .0067 .0077 .0070 .0110 .0132	
	М =	1 =	0.80			M = 1.05						
	0717 0344 0300 0342 0377 0448 0493 0616 0726	3	0839 1475 1482 1453 1379 1375 1235 1235 1158 .0715	0314 0016 .0200 .0381 .0477 .0569 .0664 .0762 .0864	.0087 .0039 .0033 .0048 .0057 .0070 .0084 .0105 .0128	-10 -7 -5 -3 -2 -1 0 1 2	4732 2780 1123 .0624 .1872 .3155 .4256 .5163 .6128	.1264 .0862 .0684 .0611 .0608 .0636 .0726 .0832 .0957	0638 1123 1356 1616 1800 1946 1993 1953 1997	0532 0288 0088 .0119 .0260 .0406 .0532 .0634 .0725	*0132 *0086 *0066 *0060 *0062 *0066 *0078 *0093 *0112	
	М	M =	: 0.90					М	= 1.10			
	*1045 *0663 *0518 *0501 *0557 *0631 *0712 *0799 *0899	3 8 1 7 1 2 9	1479 1797 2023 2067 1981 1976 1929 1873 1808	0368 0089 .0141 .0352 .0465 .0573 .0681 .0780 .0870	.0122 .0075 .0057 .0065 .0077 .0092 .0108 .0129	-10 -7 -5 -3 -2 -1 0 1 2	4479 2655 1092 0546 1584 2677 3824 4807 5856	•1168 •0806 •0664 •0591 •0599 •0645 •0714 •0819 •0959	1802 1880 1906	.0350 .0486 .0598	.0125 .0079 .0060 .0056 .0061 .0066 .0075 .0091	
	.0518 .0501 .0557 .0631 .0712	B 1 7 1 2	2023 2067 1981 1976 1929 1873	.0141 .0352 .0465 .0573 .0681	.0057 .0065 .0077 .0092 .0108	-5 -3 -2 -1 0	1092 	.0664 .0591 .0599 .0645 .0714	+ 100 +	1303 1536 1666 1802 1880	13030090 1536 .0101 1666 .0224 1880 .0350 1880 .0486 1906 .0598	

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = \text{NONE}$

α, deg	CL	CD	$^{\mathrm{C}}_{\mathrm{M}}$	cı	Cn	a, deg	CT	CD	C _M	cı	C _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5810 4900 3240 2008 1339 0803 0134 .0536 .1125 .1767 .2972 .4338 .6159 .7230 .7256 .7149					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	8571 6015 42805 1714 0841 0000 0873 1714 2649 4207 5922 8633 1376 1064 1064	.1739 .0958 .0628 .0421 .0299 .0284 .0284 .0284 .0337 .0452 .0667 .1088 .1917 .3425 .4399 .5702	.1523 .0765 .0438 .0266 .0041 .0041 .0027 0079 0183 0717 1475 1254 2399	-1044 -0726 -0537 -0340 -0208 -0102 -0000 -0106 -0204 -0318 -0507 -0711 -1029 -1392 -1392 -1343	-0258 -0157 -0088 -0052 -0034 -0015 -0015 -0015 -0027 -0046 -0088 -0187 -0509 -0509
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6492 5002 3603 2214 1449 0724 .0000 .0752 .1435 .2187 .3567 .5057 .6970 .7790 .7653	1276 00585 00282 0161 00115 00101 0074 0082 00107 0148 0262 0552 2318 2520 4141	.0447 -0079 -0048 -0048 -0060 -0012 -0043 -0012 -0002 -0012 -0024 -0012 -0290 -1048 -1305	0823 0602 0428 0254 0166 0083 .0095 .0168 .0257 .0423 .0597 .0839 .1002 .0975		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7676 5397 35397 2519 1709 0930 0030 0030 1649 2519 3958 487 7886 1.1124 1.3014 1.2234	.1660 .1003 .0687 .0487 .0435 .0391 .0384 .0399 .0442 .0523 .0723 .1748 .3310 .5087 .6105	1316 0769 0477 0249 0146 0080 0040 -0023 -0100 0215 -0421 -0766 -1307 -2142 -2374 -2739	0921 0648 0473 0306 0211 0120 0015 0084 0186 0288 0448 0630 0913 1587 1514	0238 0142 0099 0064 0025 0033 0035 0031 0086 0164 0589 0729
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7464 5820 4379 2568 1755 0794 .0000 .0868 .1718 .2531 .4249 .5820 .7484 .7945 .8129 .8406	.1249 .0623 .0327 .0155 .0122 .0105 .0091 .0109 .0140 .0190 .0373 .0722 .1339 .2444 .4397	.0253 .0029 -0135 -0163 -0094 -00041 -0033 -0024 .0021 .0090 .0123 -0024 -0257 -1414 -1504	0931 0702 0511 0296 0200 0090 .0005 .0101, .0197 .0291 .0489 .0695 .0919 .1005 .1009	0186 0108 0026 0026 0014 0001 0001 0001 0002 0015 0042 0116 0385 0511	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	7513 5519 4103 2572 1734 0809 0058 .0867 .1734 .2572 .4103 .5548 .7542 1.0836 1.3206 1.2425	1634 0995 06497 0497 0455 04412 0419 0470 0548 0746 1086 1719 3304 6295	1275 0812 0543 0336 0236 0144 0038 -0083 -0186 -0291 -0495 -0754 -1247 -2116 -2749 -2845	0905 0663 0491 0316 0214 0130 0021 .0084 .0182 .0281 .0456 .0635 .0880 .1287 .1589 .1620	0241 0151 0108 0066 0052 0038 0041 0066 0096 0171 0364 00791
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	.0098 .0985 .1969 .2954 .4529	.0169 .0138	.0824 .0515 .0261 .0116 .0043 .0026 0011 0047 0083 0145 0283 0519 0845 1245 1735	0996 0757 0558 0351 0231 0120 .0008 .0120 .0231 .0351 .0546 .0749 .0992 .1215 .1139	0225 0135 0072 0032 0022 0012 0006 0007 0001 0031 0031 00569	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20	7282 5399 4070 24961 0831 .0000 .0914 .1661 .2575 .4070 .5538 .7421 1.0522 1.2820	.1566 .0940 .0647 .0476 .0422 .0408 .0401 .0450 .0525 .0728 .1055 .1668 .3180 .5161	.0818 .0588 .0368 .0258 .0144 .0022 0086 0193 0300 0530 0799 1203	0897 0662 0507 0319 0225 0131 0034 0067 .0161 .0252 .0427 .0605 .0837 .1216 .1512	0245 0156 0114 0073 0064 0044 0043 0047 0064 0174 0355 0589

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Continued $\frac{c_f}{c} = 0.06 \qquad \frac{c_f}{c} = 0.20$

a, deg	CL	, C _D	СМ	cı	c _n	a, deg	C _L	CD	C _M	cı	c _n
		м -	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2633 - 0967 0242 1666 2257 2982 3519 4137 4594 5215 8650 87415 8650 8919 8465 8194					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6336 4396 2941 1189 -0110 -1549 -2879 -4177 -5225 -6242 -7776 -9356 1:1171 1:3486 1:2015 1:1390	*1469 *0900 *0662 *0462 *0438 *0454 *0538 *0630 *0385 *0939 *1284 *2570 *4309 *5110 *6109	.0135 0235 0460 0737 1014 1377 1654 1876 1751 2167 2339 2561 2893 3101 2963 2893	0763 0516 0336 0122 .0025 .0186 .0338 .0490 .0613 .0737 .0923 .1097 .1321 .1606 .1416 .1341	02050126007600450036004500600077009801450208031905440771
		М	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3235 - 1110 0 0234 1590 2207 2933 3 646 4674 5236 7320 8526 8526 9239 9431 9019 8965	.0790 .0236 .0167 .0181 .0203 .0236 .0296 .0370 .0430 .05518 .0768 .1179 .1900 .3013 .1955 .2434	0806 1280 1292 1261 1231 1213 1213 1289 1170 1098 1170 1503 1898 2007 2086	0389 0115 003 0196 0263 0346 0432 0562 0700 0818 1011 1131 1201 115 1091	0096 0020 0032 0007 0006 0009 0012 0018 0027 0035 0067 0115 0210 0359 0488 0604	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 2 2 0	6129 4146 2569 0916 .0000 .1067 .2238 .3545 .4567 .5618 .7301 .8893 1.0636 1.3040	.1441 .0939 .0709 .05584 .0539 .0547 .0569 .0643 .0754 .1256 .1256 .12564 .4241 .5940	.0213 -0259 -0541 -0834 -0990 -1173 -1389 -1648 -1868 -2047 -2313 -2519 -2811 -3210	0727 0469 0288 0089 .0015 .0135 .0261 .0407 .0534 .0662 .0853 .1032 .1243 .1542 .1725	0200 0130 0085 0059 0052 0060 0076 0076 0092 0135 0197 0301 0261
		М	= 0.80					М	1 = 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 4393 - 2465 - 0760 1094 11983 2855 3785 4671 5728 6655 8008 9157 10529 9750 9602	.0875 .0415 .0247 .0206 .0228 .0282 .0337 .0419 .0510 .0625 .0921 .1368 .1172 .3146 .4139 .5196	090612091316133213041341135313981407136514271530211521902305	0528 0283 0283 0087 .0131 .0232 .0335 .0439 .0547 .0677 .0783 .0952 .1116 .1291 .1192 .1152	-:0116 -:0054 -:0052 -:0010 -:0010 -:0013 -:0027 -:0040 -:0053 -:0089 -:0146 -:0239 -:0387 -:0457 -:0645	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	5851 3953 2491 0912 .0058 .1028 .2013 .3027 .4011 .5127 .6821 .80195 1.2657 1.4308	1389 0905 0691 0584 0549 05591 0669 0762 0898 1240 1689 2472 4188 6124	*0176 -0250 -0506 -0779 -0938 -1099 -1275 -1467 -1653 -1845 -2210 -2441 -2678 -3216	-0691 -0455 -0283 -0097 0012 0128 0239 0357 0471 0596 08801 1095 11497 1722	0193 0129 0085 0055 0054 0054 0067 0075 0073 0136 0194 0300 0512 0766
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5699 3936 2273 .0000 .1301 .2372 .3278 .4348 .5287 .7791 .9289 1.0805 1.1002 1.0574 1.0343	.1244 .0697 .0445 .0308 .0311 .0352 .0413 .0511 .0616 .0777 .1110 .1608 .2365 .3500 .4488 .5574	0248 0557 0867 1286 1469 1523 1534 1577 1650 1741 1945 2244 2426 2594	-00722 -0464 -0254 -0006 -0156 -0278 -0390 -0514 -0622 -0746 -0932 -1111 -1307 -1331 -1251	0244 0091 0052 0024 0023 0024 0031 0043 0074 0120 0187 0291 0440 0565 0699	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 100 15	5632 3870 2469 0916 0042 0943 1859 2816 3787 4689 6381 9683 1-2041	1351 0886 0683 0559 0526 0540 0259 0627 0730 0853 1160 1618 2354 3984	.0206 0199 0454 0746 0899 1053 1218 1374 1553 1731 2056 2320 2320	.0547 .0744 .0929 .1121	0191 0124 0090 0065 0058 0056 0063 0076 0090 0131 0190 0285 0490

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = 0.30$

a, deg	CL	CD	C _M	cı	Cn	a, deg	CL	C _D	C _M	cı	c _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2280 0510 .1019 .2360 .2816 .3406 .4103 .4613 .5176 .5686 .6839 .8046 .8958 .8931 .8556 .8234					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	5561 3530 1986 -0359 -1718 -3046 -4280 -5264 -6217 -7107 -8497 -9934 1.1558 1.3433 1.0215	.1403 .0911 .0692 .0550 .0576 .0669 .0750 .0884 .1018 .1190 .1567 .2127 .2957 .4533 .5223 .5946	0377 0757 0982 1448 1741 2066 2163 2260 2308 2412 2550 2723 2826 2965 2792 2619	0654 0389 0203 .0047 .0224 .0379 .0521 .0711 .0745 .0853 .1024 .1202 .1395 .1649 .1422	019 011 007 005 005 007 008 010 012 017 023 034 076
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2669 0520 .0986 .2532 .3409 .4011 .4750 .5311 .5914 .6571 .8022 .9117 .9500 .9309 .935	0775 0268 0268 0222 0249 0277 0337 04517 0641 0909 1339 2086 3118 4079	0923 1266 1296 1278 1326 1326 1254 1115 1115 11508 1872 1992	0332 0050 -0131 -03309 -0399 -0478 -0565 -0638 -0706 -0791 -0944 -1090 -1173 -1180	0074 0014 0006 0006 0009 0014 0024 0077 0071 0233 0366 0490 0606	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	5474 3449 1920 0075 .0275 .2235 .3599 .4724 .6524 .6524 .8069 .9568 1.1218 1.3498	.1390 .0940 .0741 .0645 .0645 .0678 .0748 .0859 .0991 .1162 .1530 .2942 .4646	0252 0683 097 1290 1483 1719 2017 2176 2249 2342 2481 2674 2926 3244	-00441 -0382 -0191 0027 0151 0273 0437 0573 0683 0790 0965 1147 1351 1638	018 011 008 006 005 005 001 012 017 023 034 057
		М :	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3339 - 1471 0 296 2 2007 2 821 3 691 4 468 5 4 21 6 3 64 7 1 6 0 8 5 2 9 9 8 0 5 1 0 9 1 5 9 3 2 4 9 6 2 0 9 4 3 5	0820 0409 0259 0305 0340 0477 0577 0668 0786 1123 1560 2298 3230 4285 5332	1223 1493 1530 1490 1465 1497 1477 1436 1346 1346 1407 1518 1981 2177 2251	0387 0146 00146 00261 0344 0476 0761 0853 1033 1203 1167 1172 1150		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	5349 3383 1879 0101 .0896 .1981 .3036 .4236 .5104 .6130 .7634 .9166 1.0843 1.3012	.1365 .0921 .0729 .0622 .0619 .0653 .0711 .0818 .0935 .1099 .1450 .1976 .2787	0230 0669 0892 1218 1388 1548 1778 199 2104 2264 2264 2584 2584 2820 3288	0614 0368 0193 .0018 .0132 .0254 .0377 .0514 .0619 .0746 .0912 .1095 .1291	018 011 008 006 006 007 008 010 012 016 022 034 027
		М =	= 0.90					М =	1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4884 3206 1233 .1019 .2138 .3174 .4061 .4982 .6002 .6824 .9669 1.1017 1.0162 1.0491 1.0326	•1172 •0715 •0477 •0416 •0424 •0485 •0554 •0668 •0809 •0950 •1314 •1835 •2619 •3453 •4690 •5726	0706 0979 1306 1626 1688 1706 1713 1778 1876 1971 2139 2248 22473 2539	0599 0359 0120 .0140 .0269 .0385 .0493 .0618 .0718 .0828 .1014 .1185 .1377 .1253	0157 0087 0029 00329 0050 0062 0060 0102 0151 0226 0325 0435 0587 0723	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	5055 3158 1731 -0028 -0900 -1842 -2839 -3809 -4778 -5678 -7257 -8670 1,0304	.1294 .1032 .0698 .0607 .0596 .0633 .0698 .0789 .0913 .1046 .1403 .1907 .2670 .4386	0248 0640 0901 1207 1330 1474 1679 1832 1992 2126 2322 2487 2708	0585 0348 0177 .0029 .0135 .0237 .0361 .0471 .0583 .0689 .0874 .1042 .1230 .1513	017f- 0114 0088 0066 0067 0085 0097 0115 0159 0218 02541

TABLE 4.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 4 MODEL - Concluded $\frac{c_f}{c} = 0.06 \qquad \frac{c_f}{c} = 0.40$

a,	C ^T	CD	C _M	cı	C _n	a, deg	c _r	CD	C _M	cı	Cn
-0		М =	0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 1719 0081 1478 2767 3439 4057 4513 5131 5668 6260 7415 8462 9053 8624 8465 8113					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4769 2533 0547 1845 .3064 .4096 .5253 .5957 .6895 .7755 .9256 1.0725 1.1882 1.3665 1.1976	.1280 .0857 .0696 .0685 .0727 .0804 .0915 .1049 .1199 .1391 .1810 .2384 .3175 .4783 .5505 .6351	0602 1121 1557 1971 2109 2213 22331 2331 2414 2608 2712 2850 2988 2786	0543 0254 0025 .0245 .0381 .0495 .0607 .0713 .0818 .0922 .1097 .1249 .1408 .1643 .1408	0180 0117 0080 0070 0073 0083 0099 0126 0148 0199 0265 0364 0573 0767
		М =	0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2045 0206 1659 3166 3989 4510 5085 6456 7210 8307 9294 9540 9974 8937 8855	.0513 .0189 .0189 .0255 .0291 .0365 .0430 .0526 .0628 .0762 .1031 .1516 .2245 .3208 .4153 .5151	0861 1182 1206 1225 1213 1201 1177 1170 1140 1110 1074 1153 1529 1826 1886 2001	0248 .0035 .0203 .0376 .0459 .0539 .0607 .0689 .0769 .0852 .0985 .1118 .1134 .1138 .1095 .1075	0054 0018 0010 0008 0010 0016 0019 0022 0028 0042 0073 0128 0223 0478 0598	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4834 2417 0826 .1066 .2417 .3678 .4624 .5600 .6425 .7296 .8797 1.0058 1.1650 1.3601 1.4202 1.3151	.1237 .0868 .0739 .0706 .0739 .0805 .0898 .1027 .1174 .1351 .1776 .2348 .3226 .4917 .6541	0525 1036 1388 1707 1940 2125 2205 2251 2305 2371 2544 2756 3002 3175 3281 3387	0521 0253 0063 0153 0299 0445 0554 0663 0763 0864 1035 1188 1381 1625 1552	0172 0112 0087 0076 0081 0093 0123 0143 0143 0259 0365 0581 0777 0943
		М :	= 0.80					M	1 = 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2529 0491 .1204 .2761 .3484 .4290 .5152 .5874 .6504 .7468 .8858 1.0118 1.1007 .9599 .9673	.0697 .0374 .0324 .0400 .0456 .0524 .0619 .0702 .0775 .0930 .1268 .1768 .2533 .3417 .4466	-1176 -1505 -1537 -1525 -1525 -1526 -1517 -1463 -1345 -1340 -1365 -1975 -2107 -2205	0283 0030 .0159 .0341 .0430 .0524 .0616 .0699 .0778 .0891 .1077 .1241 .11376 .1174 .1196 .1138	0084 0039 0024 0024 0032 0051 0058 0066 0082 0115 0174 0269 0393 1039	-10 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	4456 2488 0926 .0810 .1924 .3110 .4297 .5281 .61149 .7017 .8478 .9722 1.1313 1.3541 1.4988 1.3946	*1199 *0839 *0722 *0680 *0705 *0765 *0858 *0982 *1128 *1309 *1707 *2248 *3138 *4923 *6759 *7912	- 0 480 - 0 954 - 1293 - 1581 - 1773 - 1965 - 2125 - 2208 - 2278 - 2349 - 2528 - 2707 - 2957 - 3380 - 3584	0507 0507 0507 0077 0121 .0248 .0379 .0520 .0630 .0727 .0827 .0997 .1148 .1338 .1608 .1784	-017: -011: -008: -008: -008: -009: -010: -012: -014: -019: -013: -018: -058: -099
701		М	= 0.90	The same				М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3905 2009 .0165 .2371 .3342 .4083 .5071 .5894 .6767 .7525 .8759 1.0044 1.1394 1.0439 1.0636 1.0241	.1065 .0713 .0547 .0583 .0644 .0685 .0822 .0924 .1044 .1207 .1551 .2114 .2939 .2923 .4987 .5992	0991 1319 1683 1909 1930 1872 1945 1981 1981 2164 2382 2309 2491 2513	0454 0194 .0054 .0305 .0416 .0502 .0611 .0711 .0811 .0973 .1063 .1223 .1403 .1251 .1275	0151 0078 0053 0055 0060 0071 0082 0095 0109 0127 0168 0232 0337 0440 0594	-10 -7 -5 -3 -2 -1 0 0 1 2 3 5 7 7 10 15 20 25	1,0810 1,2916 1,4579	.1193 .0818 .0703 .0668 .0771 .0750 .0825 .0941 .1091 .1247 .1621 .2133 .2985 .4676 .6652	1533 1711 1870 2023 2128 2201 2262 2404 2606 2881 3274 3630	.0691 .0784 .0949 .1097 .1278 .1544	013 015 020 026 036 058

Table 5.- The Aerodynamic characteristics of the aspect ratio 5 model $\frac{c}{c} = 0.06 \qquad \frac{c_f}{c} = \text{NONE}$

CL	CD	c_{M}	cı	Cn	a, deg	C ^T	$^{\rm C}{}_{\rm D}$	C _M	cı	c _n
	М	= 0.40					м	= 0.95		
5664 4377 3175 2060 1459 0858 0172 .0472 .1159 .1802 .3004 .4334 .6179 .6995 .7381					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	9107 6750 5062 3251 2333 1290 0223 .0819 .1762 .2730 .4467 .6328 .8958	.1824 .1086 .0690 .0458 .0378 .0299 .0354 .0385 .0458 .0720 .1117 .1941	.1735 .1092 .0746 .0472 .0335 .0159 .0088 .0005 0082 0214 0488 0884 1641 2135	1116082406190405029401610043018603040508073010311407	0280 0169 0115 0069 0054 0025 0022 0025 0098 0192 0386
	М	= 0.60					М	= 1.00		
6817 5629 4200 2617 1781 1012 0220 0638 1451 2221 3760 5431 7147 7806 7554	.1286 .0649 .0334 .0163 .0152 .0141 .0141 .0163 .0205 .0334 .0638 .1308 .2335 .3094	.0574 .0019 -0010 .0005 .0005 -0015 .0005 .0010 .0025 .0019 .0039 .0054 -0326 -0988 -1221 -1392	0860 0673 0493 0303 0207 0113 0024 0073 0164 0254 0438 0626 0850 0965		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	8492 6351 4805 3069 2141 1189 0071 0080 	.1732 .1047 .0708 .0485 .0403 .0381 .0387 .0407 .0544 .0778 .1158 .1158 .1842	.1605 .1016 .0742 .0505 .0358 .0216 .0084 0058 0195 0321 0600 0931 1426 2205	1044 0776 0587 0386 0270 0155 0035 0035 0037 0187 0298 0494 0702 0958 1372	0261 0161 0116 0074 0058 0047 0034 0038 0043 0066 0107 0193 +.0394
	M	= 0.80					М	= 1.05		
7929 6514 5129 3066 2181 1267 0354 .0796 .1680 .2594 .4480 .6219 .841 .8135 .8047 .8430	.1341 .0718 .0385 .0167 .0116 .0116 .0116 .0131 .0167 .0218 .0427 .0797 .1435 .2464 .3319 .4364	.0427 .0134 -00139 -0085 -0045 -0017 .0013 .0006 .0032 .0085 .0098 -0045 -0313 -1056 -1392 -1591	0999 0804 0607 0358 0249 0146 0034 0092 0195 0295 0521 0736 0953 0953 0953 0953	0213 0123 00123 0037 0025 0016 0006 0010 0020 0049 0119 0257 0370 0499	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	8231 6019 4537 2896 1984 1094 0091 .00889 .1756 .2645 .4195 .5837 .7912	.1687 .1015 .0645 .0398 .0381 .0495 .0532 .0746 .1110 .1783	.1483 .0974 .0721 .0469 .0333 .0217 .0081 0071 0187 0313 0570 0867 1367 2224	- 0992 - 0737 - 0737 - 07361 - 0255 - 0151 - 0038 - 0080 0179 0283 - 0467 - 0666 0910	0251 0158 0114 0073 0060 0047 0036 0037 0044 0065 0106 0179
	M	= 0.90					М	= 1.10		
8789 6859 5190 3469 2452 1408 0314 .1043 .2008 .3156 .4773 .6546 .8554 1.0458 .9206	.1655 .0975 .0565 .0308 .0211 .0173 .0180 .0186 .0237 .0340 .0596 .1020 .1751 .3053 .3758	.1186 .0811 .0467 .0285 .0199 .0118 .0026 -0061 -0127 -0205 -0372 -0660 -1007 -1353 -1725	1086 0846 0633 0415 0299 0172 0043 .0109 .0230 .0362 .0557 .0775 .1010 .1302 .1104	0258 0155 0096 0053 0024 0012 0013 0019 0042 0085 0163 0332 0420	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7783 5854 4407 2784 1885 1009 0088 .0833 .1732 .4056 .5656 .7673 1.0655	.1622 .0959 .0636 .0426 .0366 .0362 .0366 .0410 .0486 .0700 .1046 .3246	.1436 .0975 .0708 .0451 .0320 .0209 .0078 0053 0179 0296 0543 0854 1329 2071	0956 0717 0543 0347 0245 0138 0040 .0070 .0172 .0273 .0451 .0643 .0643	0247 0158 0117 0059 0048 0038 0040 0044 0050 00112 0183
	5664437731752060145901720858017211591802300443346179562942002617178110120220681812671781101202206638145110120220663814511012022066381451101202206638145110120220663814511012022066381451126703547655792930662181126703547655792930662181126703547655792930662181126703547655792930662181126703547655792930662181126703543168021811267035431680218112670354316802181126703543168021811267035431680218112670354316802181126703543168021811267035431680 -	M 56644377317520601459085801720472115918023004433461796995381699538169953816995381699538169953816995381699538169953810102014102200141022001410220014102200141022001410220014102200141022001410238016301630218101630218101630218101630218101660254016025501602601310260131	M = 0.40 5664437731752060145908580172 .0472 .1159 .1802 .3004 .4334 .6179 .6995 .7381 .6995 M = 0.60 6817 .6995 .7381 .6995 M = 0.60 7929 .7760 .7776 .7760 .7776 .7760 .7776 .7777 .7776 .7777 .	M = 0.40 \$5664437731752060145908580172 -0472 -1159 -1802 -3004 -4334 -6179 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381 -6995 -7381	M = 0.40 566443773175206014590888017204721159180230044334617969957381699573816995738169957381699573816995738169957381699573816995738169957381699573816995738169957381699573817471	M = 0.40 56644377317520601459085801720472115918023004433461796995738116995 M = 0.60 681756629668175662966817566296681756629668175662966817566296681756629668175662966817566296681756629668175662966817566296681756629668175662966817566296681766817699569956995699569956995699573811699569956995699569956995699569956995780169957801699569	## 0.40 \$4877\$4377\$750\$1459\$20600\$20600\$20600\$20600\$20600\$20600\$20600\$206000\$20600\$20600\$206000\$2060000000000000000000000000000000000	M = 0.40		**************************************

TABLE 5.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 5 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \qquad \frac{c_f}{c} = 0.20$

α,	C _L	C _D	C _M	cı	C _n	α,	CL	C _D	C _M	cı	c _n
leg	ь		0.40			deg	-		= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	3101 1240 . 0043 . 1433 . 2181 . 2823 . 3425 . 4045 . 4534 . 5132 . 6351 . 7635 . 8447 . 8640 . 8383 . 7934					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7009 4904 3220 1684 0545 0842 2452 3888 -5077 -6241 -7851 -9461 1.1318	.1559 .0962 .0718 .0476 .0445 .0530 .0670 .0780 .0962 .1327 .1851 .2759	.0342 -0115 -0430 -0567 -0813 -1169 -1572 -1874 -2038 -2202 -2416 -2662 -2969	- 0825 - 0558 - 0561 - 0168 - 0031 - 0127 - 0313 - 0474 - 0618 - 0757 - 0945 - 1130 - 1371	-0225 -0134 -0096 -0052 -0040 -0047 -0058 -0071 -0090 -0132 -0190 -0295
		М =	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	- 3585 - 1535 - 0022 - 1513 - 2214 - 2850 - 3639 - 4758 - 5393 - 6227 - 7586 - 8814 - 9365 - 9230 - 8901	.0798 .0248 .0125 .0145 .0162 .0204 .0259 .0340 .0421 .0528 .0787 .1201 .1903 .2944 .3806	0665 1271 1285 1271 1223 1173 1183 1271 1173 1150 1081 1077 1562 1867	0431 0160 .0024 .0195 .0271 .0341 .0433 .0577 .0654 .0741 .0900 .1054 .1171 .1213	0104 0028 0014 0001 00010 0012 0013 0015 0023 0048 0101 0191 0338 0454	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6785 4697 3060 1423 0427 0641 1756 3013 4318 5623 7354 8944 1- 0771	1476 0951 00718 0590 0554 00250 00590 00648 00764 00922 1278 1797 2655	0362 -0129 -0429 -0414 -0714 -0890 -1081 -1270 -1516 -1821 -2083 -2330 -2550 -2855	0790 0528 0138 01138 0016 .0104 .0230 .0362 .0537 .0684 .0887 .1313	0215 0138 0098 0067 0059 0052 0057 0070 0088 0129 0187 0285
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	4898 3383 1515 0677 1721 2751 3765 4810 6089 7060 8649 9737 9737 9237	.0944 .0459 .0238 .0181 .0210 .0257 .0310 .0402 .0499 .0632 .0980 .1440 .2177 .3009	0738 1080 1253 1314 1340 1350 1454 14167 14568 1568 2017	0593 0386 0164 .0090 .0207 .0329 .0447 .0731 .0848 .1057 .1214 .1354 .1171	-0137 -0066 -0026 -0011 -0010 -0012 -0019 -0025 -0038 -0048 -0085 -0142 -0236 -0356	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6440 4460 2981 1320 0410 .0614 .1661 .2731 .3800 .5097 .6895 .8510	.1427 .0912 .0700 .05577 .0537 .0520 .0560 .0633 .0717 .1432 .1220 .1707 .2535	.0335 -0106 -0400 -0684 -1012 -1206 -1404 -1621 -1888 -2235 -2436 -2748	-0751 -0508 -0331 -0133 -0022 -0095 -0219 -0345 -0471 -0619 -0833 -1016 -1250	0212 0138 0097 0059 0058 0058 0075 0075 0075
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20	3195 4369 5516 6608 8328 9966 1.1796	• 1397 • 0812 • 0524 • 0343 • 0375 • 0456 • 0557 • 0692 • 0860 • 1256 • 1834 • 2759 • 2135 • 2384	0051 0233 0519 -1093 -1335 1613 1673 1764 1824 1915 2096 2398 2670 2730	0835 0596 0384 0072 .0353 .0260 .0398 .0533 .0668 .0795 .1007 .1206 .1447 .1670 .1352	0206 0119 0075 0032 0025 0029 0041 0057 0074 0121 0187 0295 0493 0554	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6194 4334 2911 1226 0350 0613 1576 2670 3655 4772 6610 8164 9937	•1389 •0899 •0673 •0555 •0517 •0511 •0544 •0608 •0705 •0850 •1173 •1642 •2449	.0358 0102 0361 0658 0811 0981 1155 1365 1544 1767 2140 2363 2634	0727 0510 0321 0121 0021 .0091 .0202 .0329 .0446 .0574 .0786 .0971 .1199	021 013 010 007 006 005 006 007 008 012 017 027

TABLE 5.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 5 MODEL - Continued $\frac{t}{c}=0.06 \qquad \frac{c_f}{c}=0.30$

a, deg	CL	CD	C _M	cı	C _n	a, deg	cr	CD	C _M	cı	c _n
		м	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	229904340954 2342303637744294485854226029724384589152906581118284					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6020 3815 2180 0198 .1338 .2899 .4385 .5351 .6243 .7259 .8721 1.0133 1.1817	.1420 .0927 .0701 .0555 .0578 .0639 .0725 .0853 .1005 .1207 .1614 .2163 .3065	0151 0636 0951 1293 1655 1929 2093 2176 2247 2340 2493 2669 2871	0722 0440 0233 .0000 .0176 .0349 .0493 .0637 .0741 .0854 .1027 .1188 .1419	0206 0128 0087 0061 0062 0074 0088 0103 0125 0168 0232
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2850 - 0614 1030 2784 3596 4429 5152 5635 6405 7104 8551 9406 9757 9825 9077 8989	.0702 .0259 .0162 .0195 .0237 .0303 .0344 .0410 .0506 .0625 .0895 .1348 .2081 .3223 .3925 .4907	077612561256125612951295127111831150110110281077145017941804	0349 0060 0134 0332 0426 0515 0607 0668 0754 0834 1007 1145 1222 1286 1179 1137	0085 0014 0010 0010 0017 0025 0029 0038 0049 0082 0136 0234 0394 0489 0610	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5723 3633 2019 0309 .0760 .1995 .3420 .4916 .5747 .6744 .8240 .9546 1.1280	.1373 .0893 .0706 .0625 .0613 .0642 .0718 .0835 .0963 .1168 .1547 .2960	0123 0583 0583 1195 1376 1875 2085 2190 2269 2400 2553 2826	-0692 -0420 -0242 -0012 -0106 0242 0415 0572 -0685 0795 0968 1130 -1360	0198 0128 0089 0071 0066 0067 0087 0102 0123 0165 0224 0328
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	3824 1956 0059 .1839 .2780 .3663 .4619 .5545 .6725 .7707 .9149 1.0179 1.1179 .9414 .9649	.0833 .0427 .0227 .0290 .0318 .0377 .0449 .0543 .0672 .0796 .1172 .1664 .3183 .4296	11031406150614611451141214311454135714481503156819002063	0446 0210 .0000 .0223 .0331 .0436 .0546 .0657 .0805 .0923 .1105 .1254 .1385 .1171 .1185	0116 0056 0025 0025 0032 0040 0049 0062 0075 0112 0169 0265 0374 0504	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5465 3529 2004 0296 0706 -1708 -2892 -4190 -5283 -6239 -7788 -9154 1.0770	.1343 .0879 .0689 .0616 .0587 .0689 .0789 .0792 .1092 .1462 .1959 .2822	- 0126 - 0539 - 0816 - 1118 - 1254 - 1435 - 1647 - 1899 - 2050 - 2176 - 2317 - 2463 - 2730	-0652 -0409 -0223 -0022 -0097 -0210 -0347 -0630 -0741 -0913 -1072 -1296	0192 0126 0095 0071 0070 0067 0086 0155 0155 0211
		М	= 0.90					М :	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5639 4345 2225 .0642 .2075 .3372 .4533 .5488 .6444 .7485 .9205 1.0567 1.2260	.1330 .0826 .0537 .0437 .0470 .0571 .0605 .0759 .0886 .1095 .1859 .2082 .2989	0595 0640 1048 1613 1782 1945 2005 1975 2066 2277 2398 2609	0703 0504 0239 .0093 .0260 .0403 .0517 .0650 .0769 .0901 .1100 .1267 .1511	-0189 -0117 -0069 -0041 -0053 -0057 -0072 -0088 -0116 -0170 -0232 -0170	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5279 3417 2037 0350 .0591 .1533 .2628 .3811 .4928 .5957 .7425 .8805 1.0338	.1281 .0845 .0645 .0592 .0582 .0609 .0663 .1034 .0888 .1050 .1416 .1901 .2730	0106 0494 0760 1051 1202 1366 1526 1754 2093 2234 2384 2636	0629 0396 0223 0021 .0085 .0202 .0315 .0453 .0585 .0708 .0872 .1029 .1238	0185 0124 0093 0074 0068 0067 0084 0098 0119 0153 0207

TABLE 5.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 5 MODEL - Concluded $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = 0.40$

a, deg	c _r	$C_{\mathbb{D}}$	C _M	cı	C _n	a, deg	C _L	C _D	C _M	cı	c _n
		М :	= 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2035 - 0086 1264 2699 3556 4006 4627 5377 5869 6341 7476 8483 8804 8547 8054					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	5252 3208 1387 .1189 .2676 .3828 .4905 .5834 .6778 .7754 .9315 1.0628 1.2338 1.4022	.1371 .0935 .0768 .0766 .0746 .0819 .0935 .1073 .1242 .1453 .1919 .2541 .3497 .4837	0405 0872 1268 1825 2072 2208 2263 2307 2389 2455 2631 2828 3047 2992	0592 0334 0106 .0195 .0363 .0500 .0623 .0496 .0852 .0953 .1121 .1337 .1520 .1664	0201 0135 0093 0078 0084 0092 0104 0135 0154 0202 0271 0383 0565
		М	= 0.60					М	= 1.00		
-10 -7 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2458 0025 1679 3358 4159 4872 5509 6211 6935 7571 8779 9503 9656 9020 9020 8800	. 0632 . 0226 . 0189 . 0248 . 0292 . 0362 . 0432 . 0525 . 0621 . 1058 . 1473 . 2278 . 3226 . 4198 . 5094	0718 1165 1175 1204 1146 1204 1155 1146 1068 1082 1038 1082 1520 1762 1762	0290 .0019 .0213 .0403 .0507 .0595 .0663 .0748 .0831 .0912 .1059 .1189 .1240 .1198 .1176 .1134	0082 0017 0017 0015 0018 0021 0025 0033 0047 0059 0168 0129 0196 0130 0158	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4975 3016 1354 .0724 .1971 .3218 .4465 .5474 .6317 .71148 .8573 1.0045 1.1613	•1319 •0911 •0765 •0712 •0730 •0791 •0885 •1016 •1174 •1357 •1793 •2365 •3352	0383 0830 1190 1618 1618 2038 2170 2238 2301 2353 2501 2711 3005	0563 0314 0108 .0141 .0279 .0424 .0556 .0885 .0786 .0885 .1040 .1250	0191 0130 0095 0082 0080 0085 0094 0108 0127 0146 0191 0257 0368
		М :	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 2935 - 0964 - 0876 2656 - 3465 - 3455 - 5164 - 6047 - 67754 - 8122 - 9211 1 0182 1 0917 - 9593 - 9446 - 9299	.0774 .0431 .0333 .0387 .0449 .0531 .0615 .0702 .0778 .0959 .1299 .1299 .1791 .1689 .4444 .5456	0970 1451 1523 1504 1513 1530 1597 1491 1328 1393 1425 1425 1491 1572 1572 1572 1940 2038 2168	0331 0085 .0126 .0329 .0430 .0531 .0629 .0751 .0826 .0989 .1151 .1289 .1423 .1234 .1211		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4827 2892 1289 0524 1548 2687 3939 4964 5829 6740 8106 9541 1.1066	.1271 .0882 .0733 .0695 .0706 .0767 .0846 .0965 .1111 .1299 .1719 .2279 .3214	- 0342 - 0776 - 1116 - 1501 - 1662 - 1854 - 2030 - 2130 - 2281 - 2267 - 2433 - 2599 - 2901	0550 0303 0108 .0113 .0234 .0367 .0504 .0632 .0732 .0836 .0995 .1198	0183 0125 0094 0082 0093 0093 0107 0125 0143 0186 0252
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	.4075 .4960 .5637 .6666 .7577 .8931	.0775 .0592 .0599 .0647 .0742 .0838 .0871 .1047 .1239	0642 0901 1376 1860 1918 2004 2033 1889 1918 2033 2033 2033 2292 2379 2223	0589 0346 0071 .0241 .0380 .0498 .0622 .0682 .0824 .0933 .1097 .1294 .1471 .1299	-0176 -0108 -0066 -0058 -0067 -0079 -0087 -0112 -0130 -0176 -0239 -0348	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4700 2859 1391 .0449 .1490 .2585 .3571 .4776 .5587 .6485 .9246 1.0648	.1209 .0854 .0722 .0670 .0692 .0746 .0824 .0940 .1075 .1258 .1665 .2219	0310 0727 1049 1405 1599 1759 2065 2137 2210 2341 3451 2743	.0955 .1153	017801200092008200830084001001240143018302490351

TABLE 6.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 6 MODEL $\frac{t_c}{c} = 0.06 \qquad \frac{c_f}{c} = \text{NONE}$

a, deg	CL	CD	CM	cı	Cn	a, deg	CL	C _D	C _M	cı	c _n
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	6162 4843 3542 2169 1500 0813 0108 .0813 .1536 .2440 .3650 .5096 .6813 .8187 1.0012 .7301					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	8915 6596 493056 1897 0822 0211 1286 2297 3309 4995 7060 9463	.1751 .1005 .0643 .0419 .0332 .0280 .0290 .0332 .0399 .0513 .0798 .1280 .2145	.1455 .1016 .0676 .0373 .0233 .0093 .0000 -0131 -0233 -0396 -0699 -1165 1818	-:1119 -:0829 -:0617 -:0385 -:0239 -:0119 :0014 :0136 :0252 :0375 :0580 :0818 :1108	0264 0149 0096 0035 0023 0020 0015 0016 0024 0050 0199
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 7 10 15 20 25	7031 5906 4312 2681 1744 0937 0056 .0787 .1669 .2587 .4219 .5981 .7537 .7856 .7725 .8044	1239 00585 00272 0111 0073 00051 00064 00101 0171 0088 00673 1378 2417	.0610 .0108 0008 0208 0112 0033 .0000 .0008 .0021 .0021 .0021 .0041 0436 1000 1120	0901 0722 0522 0322 0218 0115 0006 .0091 .0188 .0291 .0479 .0677 .0880 .0995 .0983 .0998		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	8383 6181 4585 2787 1838 0869 0182 1192 2161 3131 4787 6403 8726	.1659 .0989 .0640 .0427 .0368 .0342 .0333 .0378 .0442 .0551 .0815 .1222 .1992	.1564 .0929 .0648 .0402 .0268 .0121 .0000 0134 0290 0425 0715 1028 1622	1046 0771 0579 0360 0239 0124 0007 0118 0235 0346 0546 0742 1013	0251 0146 0096 0056 0045 0027 0027 0027 0028 0059 0058
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	8201 7026 5576 3326 2075 1100 0075 1100 2150 3101 6926 8251 8301 8677 8602	1350 0765 0381 0120 0068 00049 00059 0129 01196 0451 0889 1534 2484 4415	.0567 .0346 .0139 -0083 -0061 -0025 .0000 .0011 .0144 .0028 -0199 -0429 -1126 -1372 -1493	1060 -0882 -0688 -0405 -0255 -0142 -0020 -0121 -0235 -0344 -0587 -1003 -0991 -1072 -1068	0201 0114 005 0019 0010 0001 0001 0001 0002 0018 0062 0140 0265 0397 0504	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7909 5874 4459 2695 1745 0756 0174 1144 2074 2947 4536 6145 8200	. 1583 . 0934 . 0619 . 0405 . 0353 . 0333 . 0338 . 0386 . 0448 . 0539 . 0791 . 1196	.1449 .0901 .0605 .0395 .0249 .0107 0004 0163 .0292 0407 0665 0986 1509	0988 0737 0558 0345 0229 0113 .0000 .0110 .0220 .0323 .0511 .0706 .0941	0239 0144 0098 0056 0044 0028 0028 0028 0034 0056 0095 0071
		М	= 0.90					M	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	1170 0066 .0993 .1920 .2980 .4679 .6555 .8586	0158 0141 0184 0238 0348 0608 1064 1786	.0512 .0147 .0073 .0098	0368 0239 0136 .0000 .0125 .0243 .0393 .0596 .0821 .1057 .1336	0009 0032	2 3 5 7	0708	.0399 .0349 .0339 .0376 .0440 .0531	.1402 .0928 .0639 .0371 .0235 .0124 0008 0157 0280 0412 0680 0989 1402	0959 0709 0534 0326 0217 0112 .0000 .0109 .0217 .0317 .0498 .0688 .0920	0233 0142 0127 0058 0042 0030 0026 0024 0033 0054 0091

TABLE 6.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 6 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = 0.20$

a, deg	cr	C _D	C _M	cı	C _n	a, deg	C _L	c _D	C _M	cı	c _n
	100	м	- 0.40					м	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	- 3355 - 1435 - 0072 - 1507 - 2260 - 2960 - 3570 - 4180 - 4790 - 5436 - 6605 - 7858 - 8575 1 0513 1 2127 1 2917					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7749 5520 3791 1979 0771 .0583 .2354 .3979 .5270 .6436 .8353 .9998	.1613 .0973 .0692 .0461 .0435 .0205 .0553 .0676 .0820 .0999 .1434 .2038	.0551 .0125 0221 0544 0739 1074 1525 1908 2087 2216 2433 2728	0924 0651 0425 0199 0064 .0098 .0290 .0482 .0634 .0772 .0981 .1190	0246 0149 0105 0057 0043 0043 0055 0065 0065 0134 0197
		М	= 0.60					м	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15	- 3858 - 1692 - 0130 1376 2203 2956 3849 5132 5783 6582 7977 9130 9818 9037	.0800 .0257 .0132 .0141 .0169 .0260 .0260 .0335 .0420 .0536 .0824 .1303 .3046	0592 1258 1312 1258 1185 1185 1168 1168 1135 1065 1135 1567 1855	0462 0179 .0012 .0182 .0269 .0360 .0463 .0608 .0608 .0779 .0945 .1092 .1176	0114 -0028 -0012 -0008 -0007 -0009 -0011 -0015 -0018 -0039 -009 -0192 -0324	-10 -7 -5 -3 -2 -1 0 1 2 3 5	7322 5127 3431 1536 0479 1855 3152 4648 6005 7601 9437	.1560 .0967 .0711 .0565 .0555 .0559 .0662 .0805 .0982 .1374 .1938	.0561 .0064 0664 0656 1061 1293 1571 1924 2127 2365 2613	0885 0600 0391 0158 0036 .0087 .0236 .0391 .0568 .0713 .0907 .1114	0236 0147 0104 0074 0059 0053 0051 0074 0074
		М	= 0.80					м	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4676 4056 19459 1625 2704 3907 5122 6697 8012 9376 1.0294 1.1286 9376	.0955 .0482 .0234 .0171 .0198 .0257 .0341 .0448 .0579 .0747 .1108 .1616 .2379 .3171	0620 0922 1237 1278 1284 1306 1377 14526 1542 1542 1542 1542 1542 1542	0544 0460 0209 .0072 .0203 .0323 .0460 .0604 .0775 .1128 .1268 .1393 .1168	0147 0082 0034 0015 0012 0016 0024 0036 0075 0127 0224 0346	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	7116 4858 3233 1473 0516 .0497 .1626 .2831 .3940 .5318 .7230 .8837	.1496 .0941 .0682 .0550 .05541 .0532 .0564 .0645 .0753 .0696 .1307	.0548 .0072 0277 0626 0806 0997 1189 1654 1993 2251 2505	0839 0570 0368 0152 0043 .0080 .0204 .0350 .0483 .0638 .0860 .1049	0224 0143 0105 0056 0054 0055 0059 0065 0079 0119 0176
		М	= 0.90					М	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	-6788 -5364 -3810 -1686 0175 1883 3131 4270 5386 6525 8167 9765	.1362 .0819 .0485 .0328 .0312 .0350 .0430 .0539 .0668 .0862 .1238 .1777 .2746	0003 0075 0305 0668 1216 1506 1589 1651 1676 1869 2039 2039	0822 0636 0423 0167 .0046 .0241 .0383 .0516 .0636 .0764 .0985 .1180 .1396	0211 0130 0077 0042 0023 0026 0038 0050 0166 0166 0277	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	.6860	.1221	.0547 .0069 -0242 -0582 -0795 -1143 -1347 -1562 -1814 -2148	.0592 .0812	0218 0139 0102 0074 0054 0056 0062 0073 0082 0120 0176

TABLE 6.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 6 MODEL - Continued $\frac{t}{c} = 0.06 \qquad \frac{c_f}{c} = 0.30$

CL	, C _D	C _M	cı	C _n	a, deg	CL	C _D	C _M	cı	c _n
	м	- 0.40					м	= 0.95		
2418041202110212507334940834567517658216358752286669134092523582967					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6551 4409 259 0374 1248 2911 4471 5677 6696 7694 9358 1. 1146	.1554 .1028 .0782 .0645 .0685 .0773 .0890 .1043 .1248 .1463 .1923 .2562	0069 0515 0837 1251 1573 1950 2171 2203 2291 2410 2548 2778	0712 0443 0215 .0062 .0239 .0432 .0592 .0727 .0427 .0488 .0584 .0676	0218 0135 0096 0056 0054 0062 0072 0088 0109 0159 0227
	М :	= 0.60					м	= 1.00		
- 3063 - 0696 1095 2952 3898 4734 5532 6126 6889 7704 9096 9653 1.0581 1.0136 9245	.0835 .0319 .0206 .0251 .0301 .0369 .0438 .0507 .1077 .1123 .1639 .2519 .3616 .4327	0673 0665 1302 1302 1219 1138 1035 1035 1035 1138 1454 1753 1733	0401 .0149 .0364 .0362 .0469 .0559 .0656 .0721 .0817 .0901 .1069 .1163	0105 0032 0027 0022 0025 0028 0030 0030 0033 0064 0122 0230 0230 0484	-10 -7 -5 -3 -2 -1 0 1 2 3 5	6374 4123 2390 0319 0837 2151 3884 5218 6174 7230 8803 1. 0476	.1519 .1009 .0813 .0740 .0725 .0764 .1029 .1195 .1401 .1841 .2439	0066 0494 0837 1229 1419 1661 2057 2177 2238 2238 2291 2485 2688	0682 0408 0190 .0060 .0197 .0350 .0548 .0672 .0785 .0919 .1096 .1270	0215 0140 0100 0068 0065 0067 0069 00108 0108 0150
	М :	= 0.80					м	= 1.05		
3654 2291 0248 .1858 .2948 .3864 .4954 .6131 .7679 .8769 1.0058 1.0949 1.1147 .9686	.0931 .0476 .0292 .0338 .0393 .0469 .0766 .07704 .0871 .1063 .1480 .1985 .2687 .3545	0992 1408 1518 1436 1397 1381 1343 1397 1408 1408 1452 1381 1518 1518	0449 0259 0020 .0222 .0338 .0441 .0565 .0696 .0896 .1022 .1191 .1311 .1431 .1291	0115 0049 0024 0022 0023 0025 0038 0052 0038 0052 0036 0255 0369	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	6111 -4010 -2349 -0382 0726 1814 3132 4583 5767 6722 8250 9930	.1474 .0967 .0766 .0714 .0700 0198 .0835 .0982 .1146 .1352 .1756 .2353	-0021 -0452 -0790 -1149 -1347 -1517 -1761 -2015 -2154 -2230 -23577	-0657 -0391 -0182 -0046 -0181 -0181 -0451 -0606 -0732 -0856 -1026 -1211	0208 0134 0101 0067 0068 0071 0078 0087 0104 0144
	М	= 0.90					М	= 1.10		
5904 4548 2690 .0437 .2034 .3324 .4461 .5467 .6451 .7544 .9118	.1349 .0812 .0559 .0462 .0516 .0623 .0715 .0892 .1027 .1253 .1726 .2291	0517 0517 0856 1509 1678 1727 1872 1729 1729 1720 2114 2235	0651 0448 0209 .0154 .0329 .0472 .0596 .0720 .0823 .0962 .1157	0195 0117 0070 0040 0032 0039 0044 0053 0064 0083 0131 0154	-10 -7 -5 -3 -2 -1 0 1 2 3 5	5838 3874 2240 0367 0734 1652 2846 4223 5471 6463 7987	.1427 .0944 .0749 .0690 .0682 .0722 .0803 .0948 .1111 .1300 .1697	0422 0739 1105 1287 1430 1633 1876 2071	0193 0089 .0025 .0085 .0144 .0208 .0285 .0357	0135 0096 0073
	- 2418 - 0412 1021 2507 3349 4083 4567 5176 6358 7522 8686 9134 10925 12358 1.2967 - 3063 - 00696 1095 2952 3898 4714 - 5532 6126 6869 7704 9096 9653 10581 10136 9245 - 3654 - 10581 10136 9245 - 3654 - 1079 9653 10581 10136 9245 - 3654 - 1079 9653 10581 10136 9245 - 3654 - 1079 9679 9686 - 1079 9686 - 1079 9686 - 1079 9686 - 1079 9686 - 1079 9686	M 2418	M = 0.40 2418 -0412 -1021 -2507 -3349 -4083 -4567 -5176 -5176 -5821 -6358 -7522 -8686 -9134 -1.0925 -1.2358 -1.2967 M = 0.60 3063	M = 0.40 2418041204120217250733494083456751765821635875228686913406960319066501491995026613020340295202511302034029520251130203402952025113020362389803011322046913230489112955320438112955320438113807040135094502480259024802480248024802480248024802480259024802480248025902490259024902590248025902480259024902590249025902480259024902590249025902480259024802590248025902480259024802590248025902480259024802590248025902480259024802590248025902480259024802590248025902480259024802590249024802590248025902490248025902480259024802590248025902480259024802590248025902480259024802590248025902480259024902680269	M = 0.40 24180412 1021 1021 2507 3349 4063 4567 5176 5821 6358 7522 8686 9134 1.0925 1.2358 1.2967 M = 0.60 3063 .0835 .0656 .0149 .0022 1095 .0266 .1302 .0364 .0027 .1095 .0266 .1302 .0362 .0022 .3888 .0301 .1322 .0469 .0022 .3888 .0301 .1322 .0469 .0022 .3888 .0301 .1322 .0469 .0022 .3888 .0301 .1322 .0469 .0022 .4734 .0369 .1219 .0559 .0666 .0028 .6126 .0507 .1138 .0721 .0029 .6869 .1077 .1035 .0817 .0030 .7704 .0780 .1035 .0901 .0033 .9096 .1123 .0945 .1091 .0901 .0033 .9096 .1123 .0945 .1018 .1018 .2519 .1454 .1292 .0230 1,0136 .3616 .1753 .1295 .0338 .9245 .4327 .1733 .1163 .0484 M = 0.80 M = 0.90 M = 0.90 M = 0.90 M = 0.90 M = 0.90	M = 0.40 2418	M = 0.40 - 2418	M = 0.40 M M	M = 0.40	**************************************

TABLE 6.- THE AERODYNAMIC CHARACTERISTICS OF THE ASPECT RATIO 6 MODEL - Concluded $\frac{t}{c} = 0.06 \qquad \qquad \frac{c_f}{c} = 0.40$

a, deg	cr	CD	$^{\text{C}}_{\text{M}}$	cı	Cn	a, deg	CL	$^{\rm C}{}_{\rm D}$	C _M	cı	Cn
		М	= 0.40					М	= 0.95		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20 25	2076 .0055 .1694 .3151 .3879 .4571 .5154 .5973 .6520 .7066 .8341 .9324 .9215 .1145 1.2311 1.2639					-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5620 3487 1603 .1072 .2758 .4038 .5131 .6266 .7306 .8285 .9778 1.574	.1454 .3880 .3245 .2959 .3583 .4115 .4761 .1393 .1597 .2084 .2784	0497 0939 1345 1929 2192 2431 2447 2569 2615 2836 3030	-:0694 -:0413 -:0177 :0147 :0337 :0480 :0606 :0733 :0859 :0943 :1159 :1331	0408 0131 0093 0074 0077 0086 0098 0115 0137 0190
		М	= 0.60					М	= 1.00		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	- 2495 0170 2002 3824 4683 5534 6193 6987 7799 8554 9744 1.0046 1.216 9366 9177	.0659 .0185 .0194 .0255 .0321 .0391 .0474 .0604 .0729 .0906 .1254 .1792 .2880 .3437 .4383	0748 1207 1240 1270 1258 1136 1165 1082 1090 1061 1278 1666 1750 1834	~0318 0028 0238 0443 0550 0636 0718 0810 0895 0978 1121 1173 11338 1176		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5263 3170 1535 .0558 .2014 .3669 .4885 .5941 .6978 .7835 .9291	.1383 .0990 .0843 .0785 .0818 .0892 .1025 .1186 .1358 .2010 .2667	0459 0944 1297 1729 2002 2329 2355 2417 2461 2567 2708 2946	-:0645 -:0379 -:0177 0086 0255 0431 0573 0690 0816 0919 1090 11252	0197 0132 0098 0087 0082 0088 0098 00135 0135 0135
		М	= 0.80					М	= 1.05		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7 10 15 20	- 3272 - 1334 0692 2618 3524 4430 57702 6825 8131 9138 10271 11152 10145 8534 7124	.0804 .0443 .0295 .0399 .0477 .0558 .0717 .0842 .0982 .1188 .1653 .2198 .2643 .3144	1069 1436 1525 1487 1470 11442 1576 1459 1626 1682 1693 1525 1108	-0387 -0143 -0092 -0312 -0413 -0517 -0662 -0784 -0917 -1055 -1210 -1344 -1251 -1222 -1214		-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	5107 3156 1530 1530 1683 3060 4457 5585 6523 7422 8856 1.0482	.1373 .0974 .0819 .0762 .0800 .0880 .0988 .1148 .1327 .1524 .1962 .2606	-0410 -0855 -1202 -1633 -1815 -2149 -2259 -2259 -2403 -2479 -2657 -2869	-0638 -0387 -0189 -0059 -0059 -0193 -0341 -0500 -0619 -0724 -0842 -1006 -1161	0191 0130 0096 0082 0082 0087 0097 0112 0132 0179 0245
		М	= 0.90					М :	= 1.10		
-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	- 4876 - 3258 - 1028 - 1662 - 2886 - 3958 - 4986 - 6254 - 6890 - 7828 - 9206 1 0496 1 2376	.0559 .0623 .0721 .0844 .1054 .1086	0784 0972 1432 1756 1794 1857 2051 1881 2003 2099 2268 2651	0623 0389 0117 .0198 .0340 .0460 .0577 .0718 .0796 .0924 .1097 .1253 .1444	0173 0101 0059 0044 0051 0059 0075 0076 0099 0145 0214 0321	-10 -7 -5 -3 -2 -1 0 1 2 3 5 7	4905 2976 1470 .0514 .1617 .2811 .4097 .5236 .6118 .7036 .8414 .9921	.1319 .0912 .0777 .0741 .0777 .0845 .0949 .1093 .1260 .1455 .2457	0211 0410 0585 0789 08878 0984 11073 1134 1162 1195 1561	-0632 -0394 -0208 0033 0156 0294 0439 0572 0669 0782	0184 0129 0095 0083 0083 0087 0097 0111 0132 0176 0240

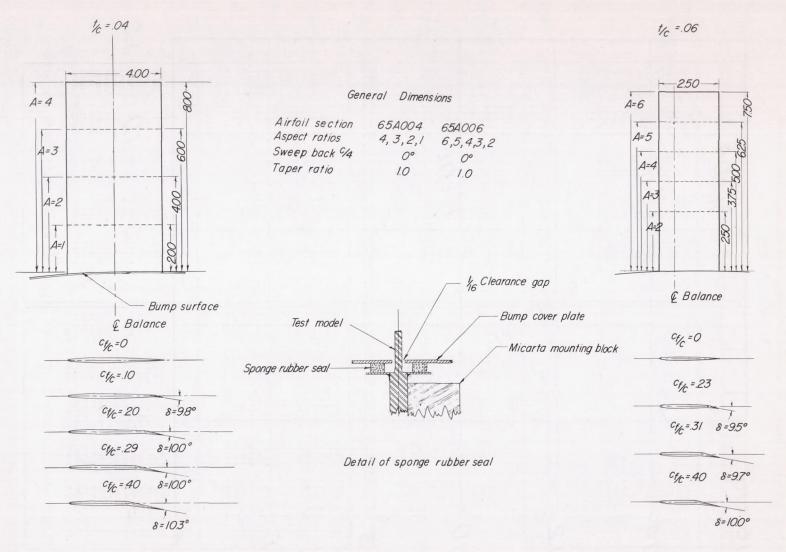


Figure 1.- General dimensions and model geometry. (All dimensions in inches unless otherwise noted.)

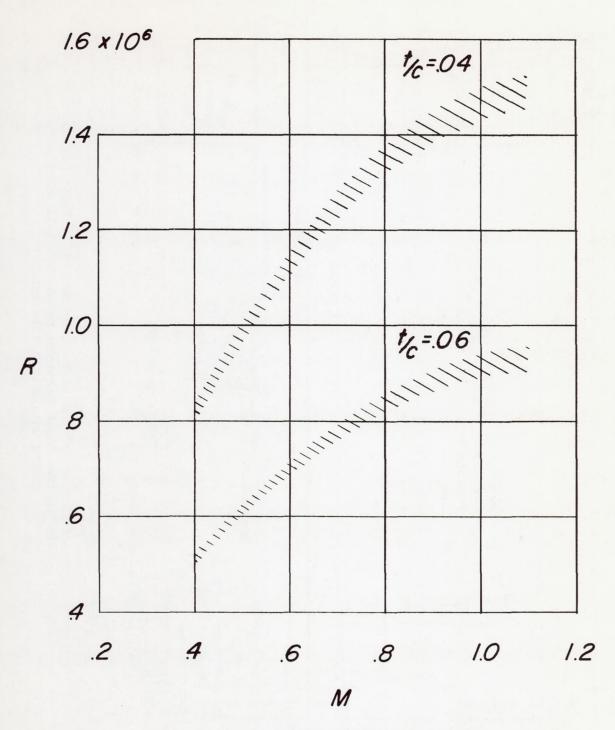


Figure 2.- Variation of test Reynolds number with Mach number.

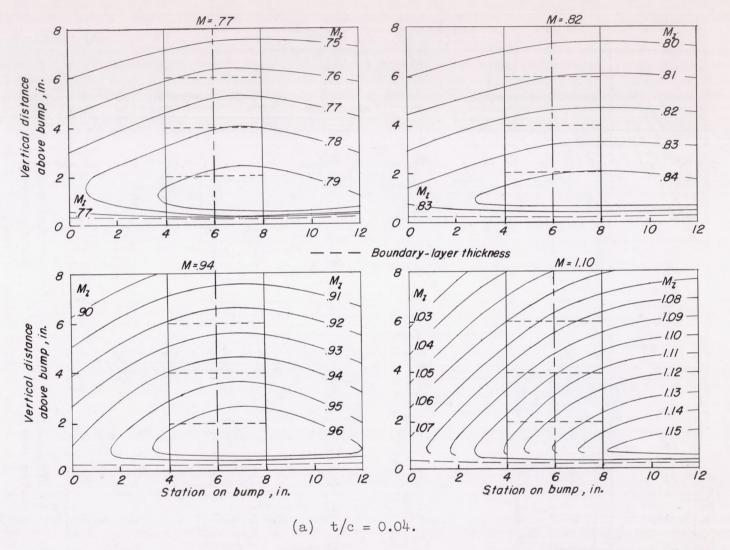
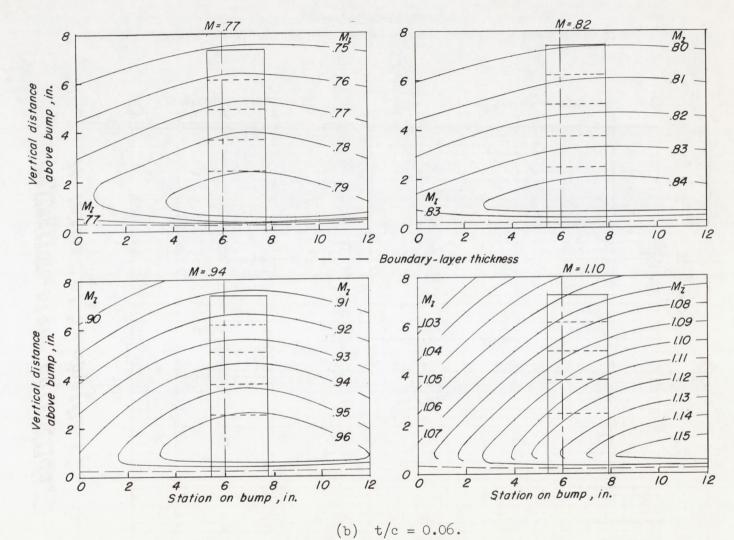


Figure 3.- Typical Mach number contours over transonic bump in region of model location.



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Figure 3.- Concluded.



Figure 4.- Variation of reflection-plane correction with aspect ratio for full-span controls on untapered, unswept wings.

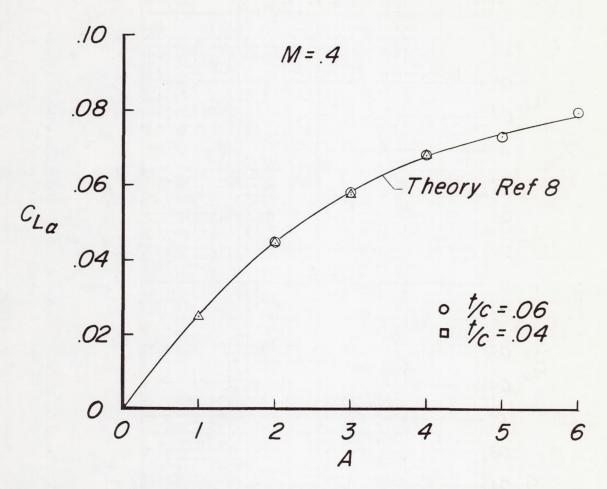


Figure 5.- Variation of the lift-curve slope with aspect ratio at a Mach number of 0.4.

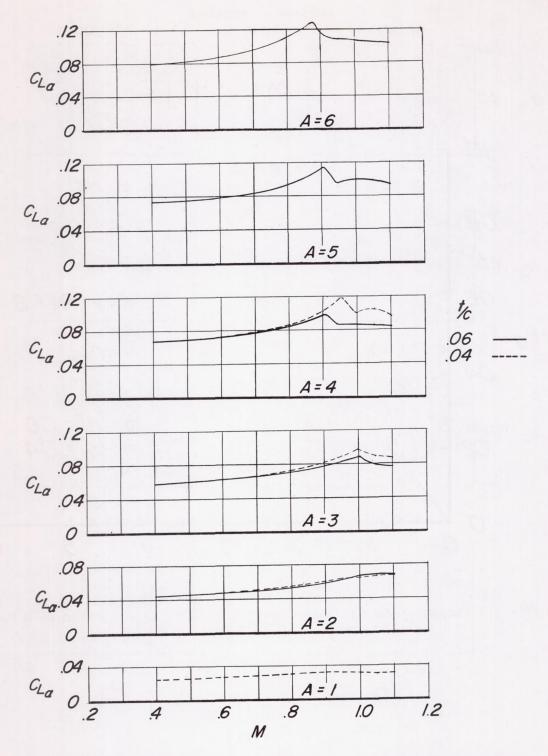


Figure 6.- The variation of lift-curve slope with Mach number.

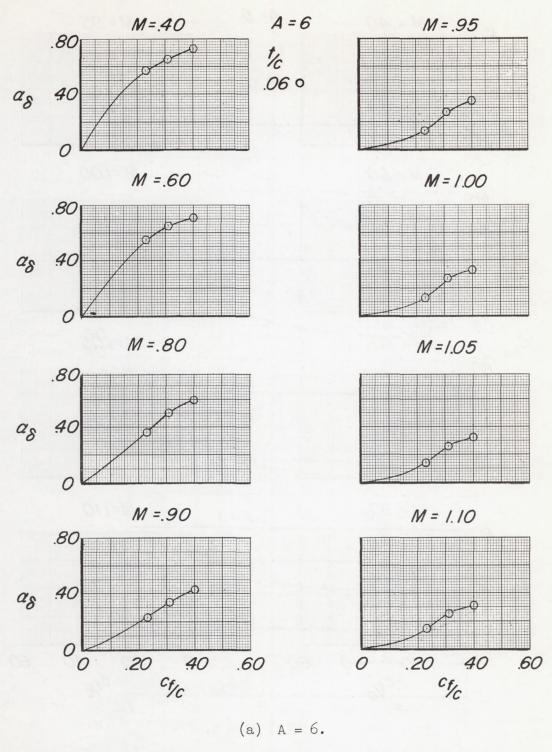


Figure 7.- Flap-effectiveness parameter α_{δ} as a function of c_{f}/c .

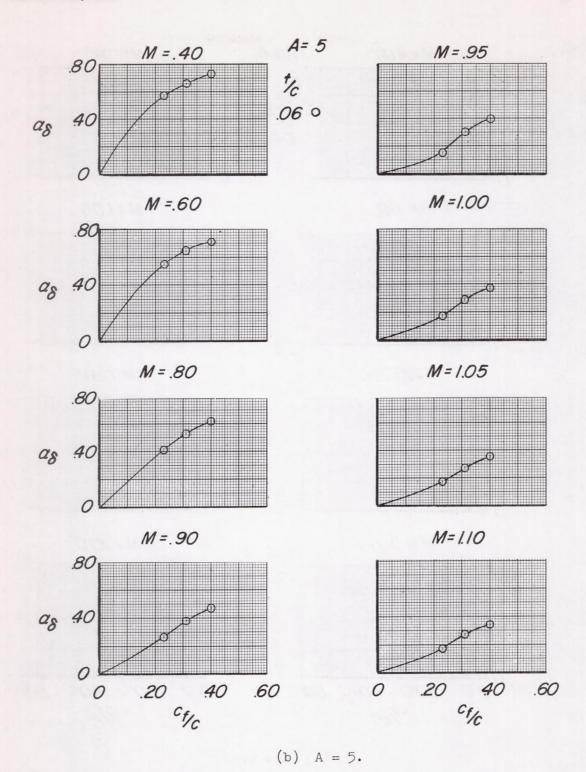
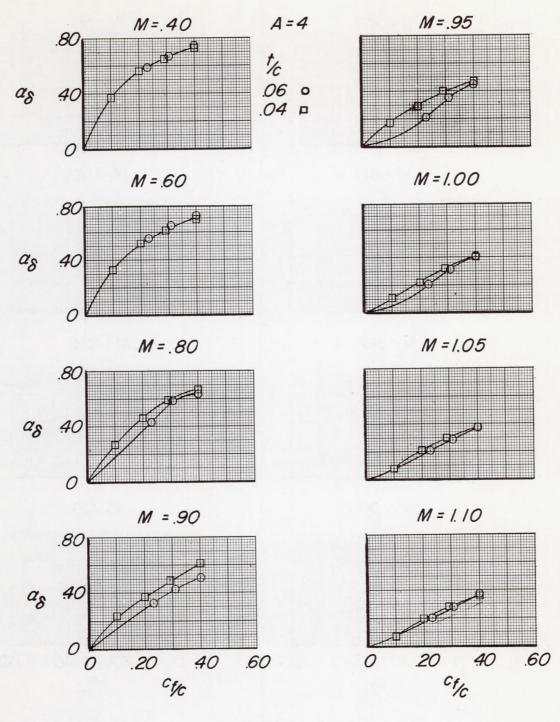
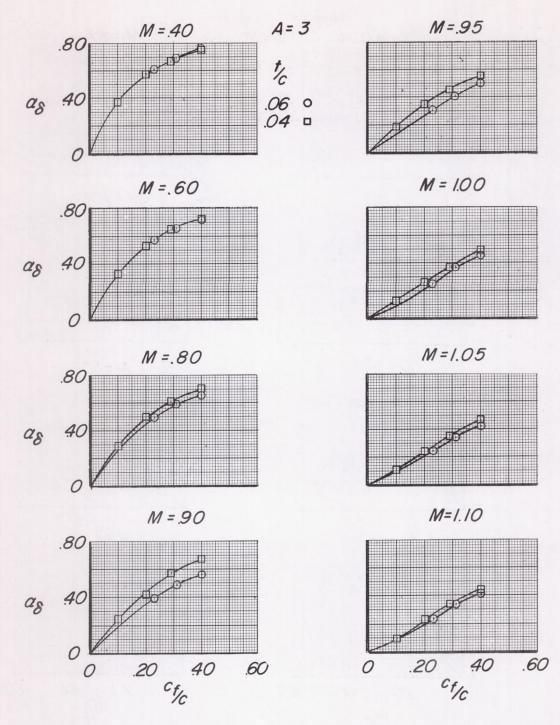


Figure 7.- Continued.



(c) A = 4.

Figure 7.- Continued.



(d) A = 3.

Figure 7.- Continued.

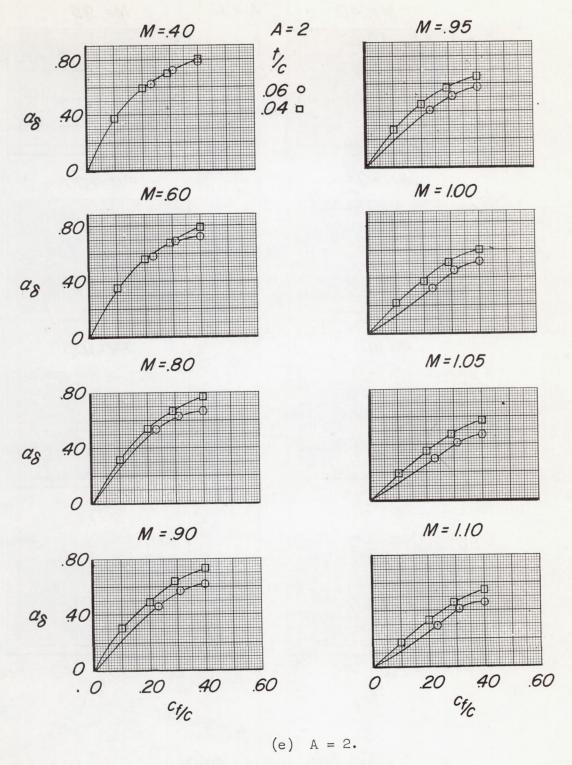


Figure 7.- Continued.

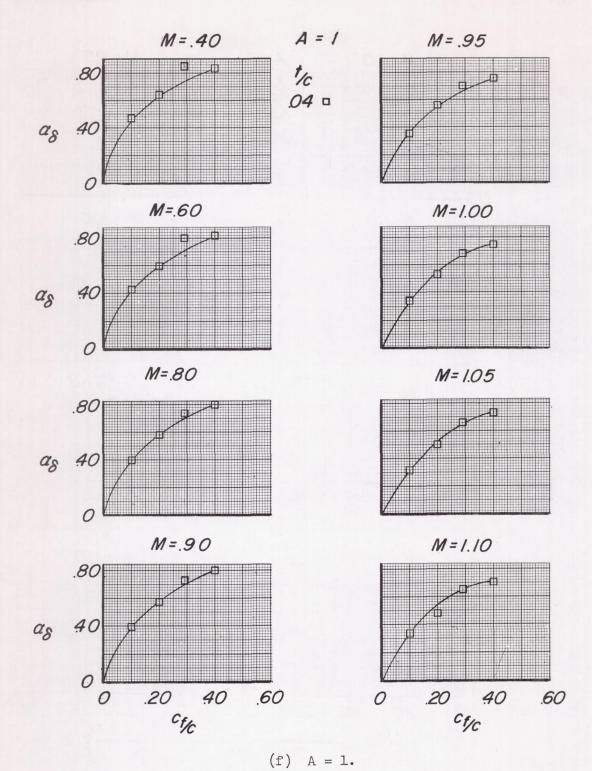


Figure 7.- Concluded.

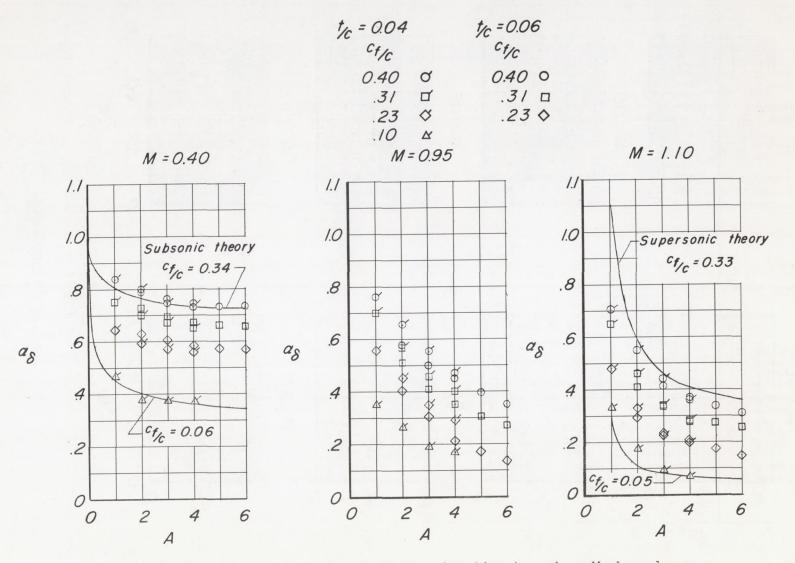


Figure 8.- Variation of $\,\alpha_{\delta}\,$ with aspect ratio at various Mach numbers.

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